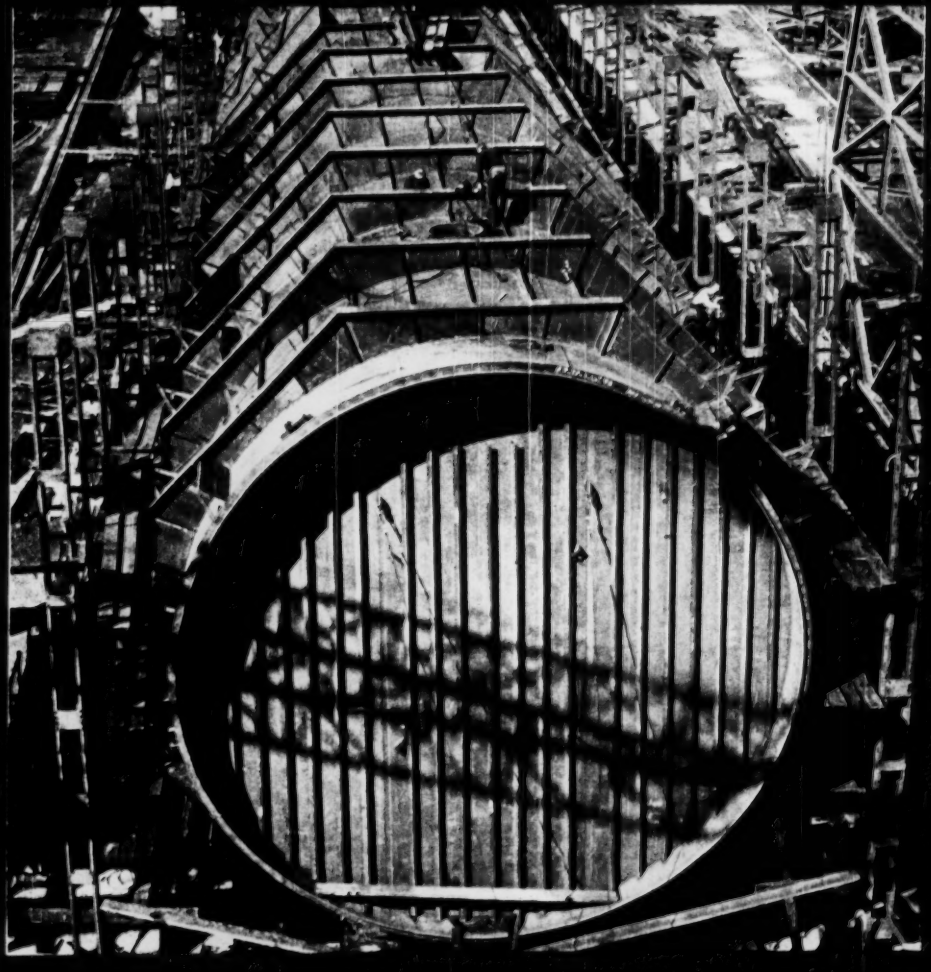
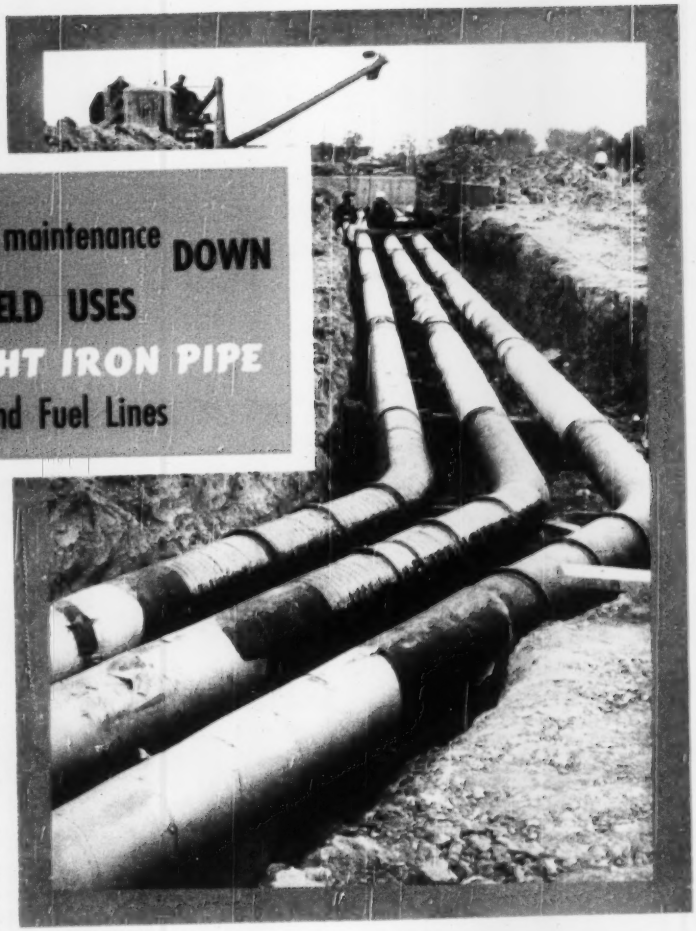
ENGINEERING NEWS-RECORD



A McGRAW-HILL PUBLICATION



To keep planes UP and maintenance DOWN

O'HARE FIELD USES BYERS WROUGHT IRON PIPE for Underground Fuel Lines

These runs of 12-inch Byers Wrought Iron pipe are part of an extensive underground fueling system that brings high-octane gas from a "Tank Farm" to aircraft service islands at O'Hare Field, Chicago. Over three miles of Byers Wrought Iron pipe, in 2, 3, 5 and 12-inch sizes, have been installed in the current project. Plans call for the ultimate installation of over 30 miles of wrought iron line.

Full realization of all the efficiency, safety, and economy possibilities of such an installation naturally demands complete dependability and maximum durability in the piping material. Since some of wrought iron's longest and most impressive records have been made in underground jobs, it was a logical choice for the application.

In one historic instance, a wrought iron line was installed between the Northwest Pennsylvania oil fields and Marcus Hook, near Philadelphia. After 30 years of use, the pipe line company disbanded, and the pipe was dug up, cleaned, and sold for reuse. A 44-mile run of the reclaimed line was installed in Oklahoma, where it served for an additional 14 years—and finally was again resold for other services.

Regardless of the fluids handled, every underground line faces a threat of corrosive attack from the soil. The severity varies widely but regardless of intensity, wrought iron's extra corrosion resistance provides a valuable extra margin of safety. The tiny fibers of glass-like silicate slag that are threaded through the body of high purity iron halt and disperse corrosive action. The fibers also help to anchor the initial protective scale, which shields the underlying metal—just as a scab protects a wound.

If you are concerned with the installation or maintenance of any underground line, you will find some helpful information in our bulletin WROUGHT IRON FOR UNDERGROUND SERVICES. We will be very happy to send you a complimentary copy, on request.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, Salt Lake City, San Francisco. Export Division: New York, N. Y.

CORROSION COSTS YOU MORE THAN WROUGHT IRON

BYERS
GENUINE WROUGHT IRON
TUBULAR AND HOT ROLLED PRODUCTS
ELECTRIC FURNACE QUALITY ALLOY AND STAINLESS STEEL PRODUCTS

2 ways to Better Air Service

GOODYEAR INDUSTRIAL RUBBER PRODUCTS
-Specified EMERALD CORD AIR HOSE for
ALL HEAVY-DUTY TYPES OF AIR SERVICE
A—Super-tough, non-gouging green cover
B—Reinforcement of high-strength cord impregnated with "Adhezo" for greatest strength, best adhesion, reduced wall gauge
C—Non-porous, seamless, oil-resistant, non-flaking tube
A
B
C
Emerald Cord Air Hose is made with one, two, or three braids depending on severity of service—is the finest air hose available anywhere.
GOODYEAR INDUSTRIAL RUBBER PRODUCTS
-Specified REDWING-H CORD AIR HOSE for
MINES, QUARRIES, CONSTRUCTION JOBS
(direct connection to compressors, etc.)
A—Rugged red cover of "cushiony" rubber stock
B—Rayon cord braids for strength and resistance to shock blows
C—Non-porous, seamless, oil-resistant tube will not flake
A
B
C
FOR HOSE, FLAT BELTS, V-BELTS, MOLDED GOODS, PACKING, TANK LINING built to the world's highest standard of quality, phone your nearest Goodyear Industrial Rubber Products Distributor.

FOR the best service at the lowest cost in the long run, ask the G.T.M.—Goodyear Technical Man—for either of these pace-setting hoses. Emerald Cord is the finest air hose made—Redwing-H Cord gives high quality at a lower price. To consult the G.T.M., phone your nearest Goodyear Distributor, or write Goodyear, Akron 16, Ohio.

Emerald Cord, Redwing—T. M. ® The Goodyear Tire & Rubber Company

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THE GREATEST NAME IN RUBBER

6 hours' work done in 45 minutes

ANYONE CAN USE THE

BERGER

JIG COLLIMATOR

famous for

ACCURACY IN ACTION

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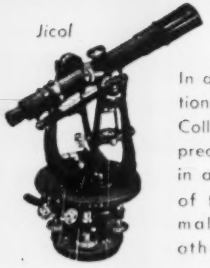

In actual production, the Berger Jig Collimator enables precision alignment in a small fraction of the time normally taken by other methods.

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with detachable stride level

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ENGINEERING NEWS-RECORD

Volume 144 JUNE 8, 1950 No. 23

WALDO G. BOWMAN
Editor

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Your Northwest is a real Rock Shovel! It is designed as a Rock Shovel and it has a combination of advantages for *rock digging* that no other shovel has!

The Northwest Dual Independent Crowd utilizes force most other independent Crowd Shovels waste—result, it handles harder digging and more yards per hour.

The Northwest Welded Boom design is based on scientific tests, combined with the results of performance in the field, not on theory. The Cushion Clutch eliminates shock overloads to all parts under power before damage can occur. Uniform Pressure Swing Clutches take the jerks out of swinging and the "Feather-Touch" Clutch Control takes the back-breaking effort out of operation.

Your Northwest is a Star on the tough jobs—or any job. Where other equipment may be known as "A Good Crane," "A Good Dragline," "A Good Shovel or Pullshovel," Northwest is universally recognized as a leader whether operating as a Shovel, Crane, Dragline or Pullshovel.

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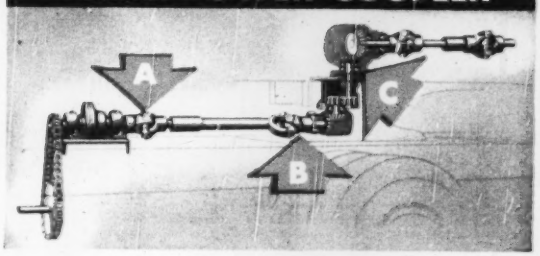
CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

NO HOIST HOSES NEEDED* to operate this FRUEHAUF Dump Trailer!

This Fruehauf Dump Trailer is a model YGT5517-21 with 21 cubic yd. capacity body. It is equipped with Gravity-Tandem Suspension.

*It's Equipped to operate with Fruehauf's Patented POWER COUPLER



TROUBLESOME hydraulic hoses are not needed to operate this Dump Trailer. The Fruehauf Power Coupler utilizes the motive power from your tractor to operate the hydraulic cylinder of the Dump Trailer at any time!

And . . . this new idea in power transmission does not limit the use of your tractor to pulling a Dump Trailer! The Power Coupler king-pin is ingeniously constructed for use with Platforms, Carryalls, Vans, Tank-Trailers, etc.

Let your Fruehauf man show you the advantages of the Fruehauf Dump Trailers—and they are many—as well as those of the *Fruehauf Power Coupler*. Coupler driven hoists on Fruehauf Dump Trailers "double-up" on the use of your tractor—permitting you to pull your Trailers in shuttle *without costly, time-consuming change-overs.*

Fruehauf's Power Coupler may be used wherever power transmission is needed between a tractor and Trailer. Diagram above shows how tractor power is transmitted from chain drive through a torque regulator and universal joint to drive shaft (A). A second universal joint and gear assembly (B) transmits power through hollow king-pin (which is strong enough to withstand a direct pull of 115 tons). The bottom king-pin gear (C) transmits power into the Trailer gear box to operate the hoist mechanism.

FRUEHAUF TRAILER COMPANY

DETROIT 32 • LOS ANGELES 11

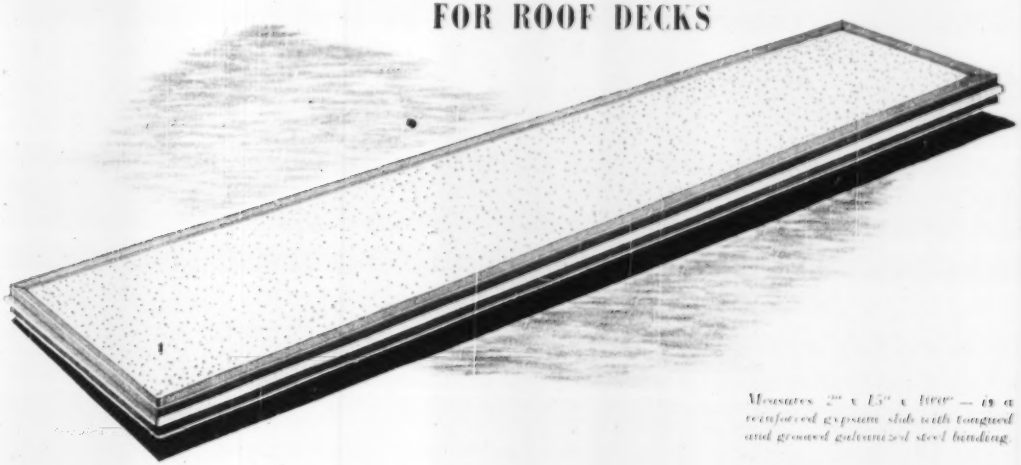
In Canada: Weston, Ontario

80 Factory Service Branches

FRUEHAUF Trailers

WORLD'S LARGEST BUILDERS OF TRUCK-TRAILERS

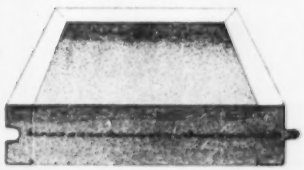
Check these 8 ADVANTAGES *of*
GYPSTEEL PLANK
FOR ROOF DECKS



Measures 2" x 15" x 10'0" — is a reinforced gypsum slab with tongued and grooved galvanized steel binding.

- ✓ **FIRE-RESISTANT**: made of gypsum.
- ✓ **INSULATION**: equal to 9 to 10 inches of concrete.
- ✓ **LIGHT IN WEIGHT**: approximately 12 pounds per square foot.
- ✓ **STRONG**: may be used for spans up to a maximum of 7 feet.
- ✓ **ATTRACTIVE FINISH**: exposed under surface requires no additional decoration.
- ✓ **EASILY ERECTED**: no form work, mixing or pouring required; easily sawed, cut or bored.
- ✓ **ECONOMICAL**: keeps erection and labor costs at a minimum.
- ✓ **NO WASTE**: end joints are staggered and need not come over supports. Small pieces may be used to start new rows.

The bindings mesh to form a steel I-Beam that gives Plank its definitely calculable strength and permits the joints to be safely broken between supports. Yet both steel and gypsum are flexible enough to warp or bend within reasonable limits.



The binding is clinched into the gypsum surface. Cross-section shows how steel and gypsum are flush and smooth, presenting a level, uniform surface.

CERTAIN-TEED PRODUCTS CORPORATION
ARDMORE, PENNSYLVANIA

Certain-teed BUILDING PRODUCTS

Certain-teed
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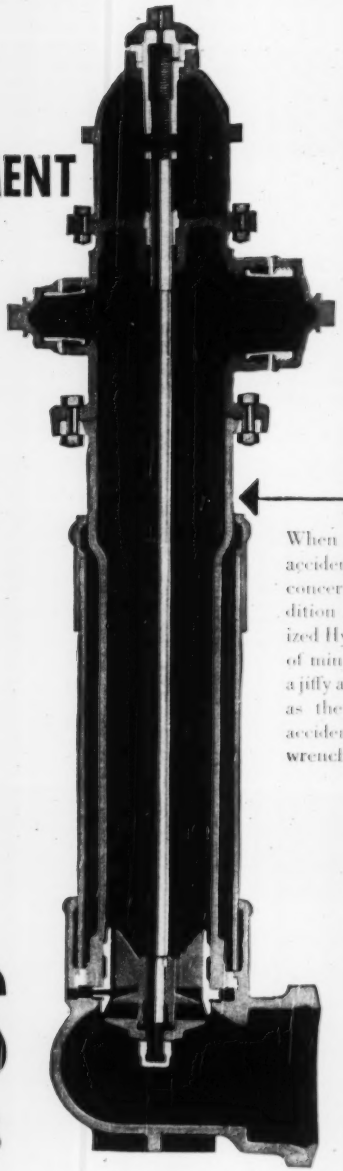
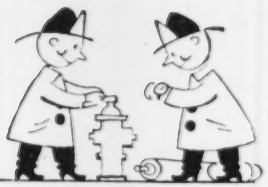
Quality made Certain . . . Satisfaction Guaranteed

ASPHALT ROOFING • SHINGLES • SIDINGS • GYPSUM PLASTER • LATH • WALLBOARD • ACOUSTICAL TILE • INSULATION • FIBERBOARD • ROOF DECKS

SPEED OF REPLACEMENT MEANS SAFETY FOR THE COMMUNITY





When a hydrant is broken in a traffic accident, it is a matter of community concern to get it back in operating condition promptly. The Mathews Modernized Hydrant can be restored in a matter of minutes! Two men can do the job, in a jiffy and *without excavating*, just as soon as they can get to the scene of the accident with a spare barrel and a lug wrench.

MATHEWS HYDRANTS

Made by R. D. Wood Company

Public Ledger Building, Independence Square, Philadelphia 5, Pa.

Manufacturers of "Centrifugal" Pipe (centrifugally cast in sand molds) and R. D. Wood Gate Valves

THE FIREMAN'S FRIEND

MATHEWS MODERNIZED HYDRANTS SET THE PACE: Easily maintained because simple in construction • All working parts contained in the replaceable barrel • Stuffing box cast integral with nozzle section • Head can be turned 360° • Replaceable head • Nozzle sections easily changed • Nozzle level is raised or lowered without excavating • Protection case of "Cast-Spun" cast iron for extra strength, toughness, elasticity • Operating thread only part to be lubricated • A modern barrel makes an old Mathews good as new

Barber-Greene

NEW BOOK PRESENTS THE Redi-Fab SERIES

a new, practical, simplified conception of belt conveyors

Select the DRIVE that suits your need
Redi-Fab Conveyor LAYOUT SHEET
Selection Table 24" BELT WIDTH
Selection Table 24" BELT WIDTH

Send for Your Copy

Here in this new 40-page catalog Barber-Greene presents the Redi-Fab series of belt conveyors—in a manner that completely unravels the mysteries of conveyor selection and application.

An entirely new concept of belt conveyor design, the Redi-Fab series enables you to get a belt conveyor question almost instantly—and delivery from stock.

And this new 40-page Redi-Fab catalog makes it possible for you to figure your own requirements if you wish. No knowledge of horsepower required. Your Redi-Fab Conveyor, which you can select from this catalog, will automatically have the correct size of drive and motor. In fact, with the new layout sheet in the Redi-Fab catalog you can make your own layout, right down to locating and selecting the "A" frame support parts. These are just the high spots—fill in this coupon and get your copy at once.

Use this coupon!

to bring your copy of this new catalog!

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BARBER-GREENE
AURORA, ILLINOIS
Constant Flow Equipment

WHERE PIPE LINES ARE CONCERNED...

It's never a lucky break

BELOW—Installing the 30" Lock Joint supply line for Ciudad Trujillo in the Dominican Republic. This line, undamaged by shocks which destroyed many structures in the vicinity, gave unimpaired service throughout the severe earthquake of 1946.

RIGHT—Damage attending the rupture of a large water main in a crowded community.

ONE SLIGHT FLAW IN A PIPE may develop the proportions of a major catastrophe when an important water line ruptures in a crowded area. Utilities can be impaired, property flooded, traffic stalled, business lost, life endangered. A bad break in more ways than one, but a break which could be avoided by using Lock Joint Pressure Pipe.

Lock Joint's water-tight expansion joints built into every section of pipe provide unrestrained flexibility under back loads to accommodate not only normal ground settlement but traffic vibrations and variations in temperature. The high factor of safety assured by its time-tested design of reinforcement provides for every pipe an abundant reserve against water hammer and pressure surges. Experience shows conclusively that Lock Joint Pressure Pipe does not fail.

When planning your next water supply main—specify Lock Joint Concrete Pressure Pipe—the pipe with a proven record of safety.

SCOPE OF SERVICES—Lock Joint Pipe Company specializes in the manufacture and installation of Reinforced Concrete Pressure Pipe for Water Supply and Distribution Mains in a wide range of diameters from 16" up as well as Concrete Pipe of all types for Sanitary Sewers, Storm Drains, Culverts and Subaqueous Lines.

LOCK JOINT PIPE COMPANY

Est. 1905

P.O. Box 269, East Orange, N. J.

PRESSURE PIPE PLANTS: Wharton, N. J., Turner, Kan., Detroit, Mich.

BRANCH OFFICES: Casper, Wyo. • Cheyenne, Wyo. • Denver, Col. Kansas City, Mo. • Valley Park, Mo. • Chicago, Ill. • Rock Island, Ill. Wichita, Kan. • Kenilworth, N. J. • Hartford, Conn. • Tucumcari, N. Mex. Oklahoma City, Okla. • Tulsa, Okla.

LOCK JOINT
Reinforced Concrete
PRESSURE PIPE

You hear it from coast to coast...*

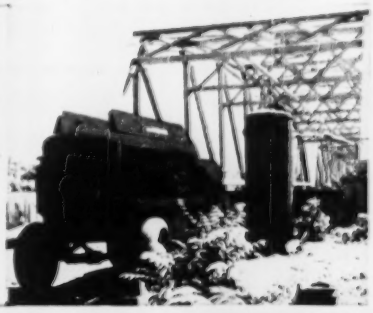
"It's BLUE BRUTES For My Money!"

***PENNSYLVANIA**

A 315' Portable Compressor and UMW Wagon Drill, one of many Blue Brute teams owned by Cramer Construction Co. of Lebanon, Pa. Pres. G. B. Cramer writes: **"We have used Blue Brutes for several years, and on our Lebanon Veterans' Hospital job have five Blue Brute Compressors powering Worthington Wagon Drills and Rock Hammers. As evidence of their entirely satisfactory performance we recently purchased another 315' Blue Brute Compressor."**

***OHIO**

In Waterville, Ohio, the Crawford Steel Construction Co., Inc., of Cincinnati, erected the structural steel on the new highway bridge across the Maumee River. Company official J. A. Crawford says: **"Our 210' Blue Brute Compressor is efficient, well constructed and rugged. It has given us excellent service, and we are more than willing to recommend it highly . . . This first experience with your products is evidence to us of Blue Brutes' superiority.**



***OREGON**

It's another Blue Brute UMW Wagon Drill. Ready to swing into action at any angle, it is here helping to cut through a road cut where the timber grows tallest. The Kuckenberg Construction Company of Portland, Ore., are the owners and the report from this firm says they **"wish all their other machines on the job were as good . . . and are going to change to Blue Brutes in future replacements."**

***WISCONSIN**

Opening up a new limestone quarry in Sussex, Wisconsin, is easy work for these rugged, hard-hitting Blue Brute team-mates. The fast, versatile UMW Wagon Drill is drilling 6-foot holes for explosive charges. Power source is a 315' Blue Brute Compressor, that gets all the air out of every drop of fuel. Vice-President Lloyd Wolf of the Quality Limestone Corporation, reports: **"After thorough investigation we decided Worthington equipment was best . . . They are fine machines."**

From the Atlantic to the Pacific you'll find Blue Brute owners — on every type of construction project, from the smallest to the largest — glad to tell you of the cost-cutting, trouble-free performance that is helping make estimates pay handsomely.

There are a lot of sound reasons for this country-wide acclaim — all adding up to the fact that *there's more worth in Worthington*. Your nearby Worthington-Blue Brute Distributor is ready with those reasons, and can make immediate deliveries. See him, or write us direct.

Worthington Pump and Machinery Corporation
Construction Equipment Department
Harrison, New Jersey

Distributors In All Principal Cities

WORTHINGTON

HO-8

BUY BLUE BRUTES

IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB

4 NEW Rubber-Tire Lorain "TL's" with 50% MORE Lifting Capacity

Bigger and *better* — there's a short 3 word description of Thew-Lorain's latest developments in the field of rubber-tire cranes, shovels, draglines, clamshells, hoes, . . . The new, heavy-duty 3 4 yd. Lorain TL-25 turntable is now available mounted on a series of new, longer and heavier 6 wheel carriers . . . The resulting machines will lift 15 tons — 50% more than previous "TL" models . . . These machines are offered you in 2-engine Moto-Cranes and single-engine Self-Propelled machines in the following models.

Model	Moto-Cranes	Self-Propelled
Standard Track Carriers	Model MC-254	Model SP-254
Wide Track Carriers that greatly increase lifting capacity "on rubber"	Model MC-254W	Model SP-254W

ADD THESE NEW FEATURES TO PROVED "TL" RUBBER-TIRE PERFORMANCE

1. New 15 ton lifting capacity.
2. New, longer, heavy-duty TL-25 turntable.
3. New pin-connected crane boom — more capacity and more reach.
4. New, longer specially designed shovel-crane carrier.
5. Bigger tires for better soft-ground flotation.
6. Front wheel drive available on Standard Track Carrier.
7. Wide Track models available for maximum "on rubber" lifting capacities.
8. Full convertibility to crane, shovel, dragline, hoe, clamshell booms with equal efficiency.

Get the facts on the *Biggest* and *Best* in rubber by calling your Thew-Lorain distributor.

THE THEW SHOVEL CO.
LORAIN, OHIO

MORE SELECTION in the New H SERIES Lorain on RUBBER

THEW LORAIN®

SHOVELS • CRANES • CLAMSHELLS • DRAGLINES
HOES • MOTO-CRANES

SEE YOUR *THEW-LORAIN* DISTRIBUTOR FOR ALL THE FACTS

NEWS BRIEFS

Expensive, No?—It'll cost somewhat more than $1,000 per foot to build the second section of Toronto's Yonge Street subway (bids approximately $7,000,000; length 6,764 ft). But Canadians are gratified that an all-Canadian organization will do the job. First section is being built by a combination U. S.-Canadian firm.

Inexpensive, Yes?—Massachusetts legislators have been told, in effect, that they can't afford not to build a $20,000,000 wholesale market for Boston. The cost, proponents argue, could be amortized by elimination of annual spoilage losses running from $4,000,000 to $6,000,000.

Better Late . . .—Federal Bureau of Mines figures it can extinguish a 25-year-old coal seam fire near Teela, Wyo., by blanketing the entire area under a 10-ft layer of compacted earth and rock. It'll take about 210,000 cu yd of fill. The fire has consumed an estimated 500,000 tons of coal.

Save it for the Russians—Four West Virginia lads wound up in the pokey after they damaged four bulldozers in the course of a make-believe tank battle. Herman Brothers Co., of Grafton, West Virginia, estimated damage to its machines at about $2,000—bent frames, stripped gears and burned-out bearings.

It's a Fact—After long, complicated delay, Ohio's Turnpike Commission has picked the J. E. Greiner Co., Baltimore consultants, to make engineering surveys of the proposed Ohio Turnpike. Cost will be $267,500. Parsons, Brinckerhoff, Hall and Macdonald, New York, will make the traffic and revenue studies, at $70,000.

Wanted: Bridges—Louisiana legislators are considering a bill to establish a state bridge authority comparable to those which exist in New York, California, New Jersey and Pennsylvania. It wants to be able to build structures needed now without having to rely on the limited financing possibilities of state-backed bond issues or gas tax revenues.

Watch It, Men—Federal Housing Administrator J. D. Richards has emphasized that contractors on FHA-multi-family housing projects must be meticulous in observance of the agency's prevailing wage requirements. FHA will withhold insurance of future

(Continued on page 12)

HOW TO MEASURE TRADE WASTES ACCURATELY

In accordance with anti-pollution laws recently enacted by numerous states, most industries now face the task of purifying their plant wastes before discharging them into adjacent streams and rivers.

This purification process usually requires special plant construction, and invariably the necessity exists of obtaining flow data, whether this be the simple indication of flow rate or a more permanent method of recording and totalizing the flow through the plant. With purification processes of this kind, measuring equipment usually is located at the point of discharge of partially filled pipe or in open channels, where low heads or pressures exist and where measurement is either difficult or impossible when using standard forms of measuring instruments.

The Simplex type S Parabolic flume, either alone or in conjunction with a Simplex type HF water float operated meter, is the ready answer to this measuring problem. Compact in design, with no pockets or grooves to catch sediment or solids, and capable of operating under low flow conditions, the unit measures over long ranges, from maximum to 5% of maximum capacity.

Available in standard pipe sizes of 6 inches to 36 inches diameter inclusive, the flume can be attached to even larger sizes by means of eccentric reducers.

IT'S SIMPLEX
IT'S ACCURATE

Write for Bulletin 210, to the Simplex Valve & Meter Company, Dept. 6, 6751 Upland Street, Philadelphia 42, Pa.

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VALVE AND METER COMPANY

Simple Arithmetic IN DREDGING!

If you want the best light-weight pipe for dredging service, just make this simple addition to your equipment.

add:

SHORE PIPE
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+ INTAKE PIPE
+ DISCHARGE PIPE
+ SAND AND GRAVEL CONVEYING LINES

The Answer is... NAYLOR PIPE

The proving factor is Naylor's exclusive reinforcing truss formed by the Lockseam Spiralweld structure which makes Naylor Pipe stronger, safer . . . superior to ordinary light-weight pipe in this service.

Sizes from 4" to 30" in diameter with all types of dredging fittings and connections.

NAYLOR PIPE COMPANY
1248 East 92nd Street, Chicago 19, Illinois
New York Office: 350 Madison Avenue, New York 17, N. Y.

(Continued from page 11)

advances if it can demonstrate past failure to observe the regulations.

You Can't Do That—Pomona, Calif., city councilmen met a barrage of legal opinions when they enacted an ordinance forbidding themselves from approving any state highway route through their city other than a specified northern route. The State Highway Commission, armed with opinions that such an ordinance was unconstitutional, pushed through its plan for a southern route.

The Merchandising Influence—A. B. Cole, Meshoppen, Pa., contractor, was low bidder on a highway job in Luzerne County (Scranton). His bid, for 1.88 mi, was $99,999.99.

Happy Motoring—North Carolina, having got its $200 million rural road program nicely underway, isn't going to forget its primary system. Highway Commission Chairman Henry Jordan says the state will undertake a study for a long range program to modernize its system. There's $60,000 available for it. Meanwhile, James S. Burch, statistics and planning engineer for the Highway Department, says that at least 500 mi of the primary system need widening if they are to meet existing traffic needs.

Same Old Tussle—Louisiana's Highway Department is the latest to become embroiled in the old bridge versus tunnel argument, this one centering around a proposed bridge across the Harvey canal from Avondale to Algiers. Most of the 23 objectors to the proposed structure don't think its 50 ft clearance is sufficient.

Lo, the Poor Taxpayer—A West Virginia judge has upheld a Morgantown ordinance which permits city streets to be black-topped at the expense of abutting property owners.

MAJOR MEETINGS

Western Association of State Highway Officials, Mapes Hotel, Reno, Nev., June 12-15.

Pennsylvania Sewage Works School, State College, Pa., June 19-23.

American Congress on Surveying and Mapping, 10th annual convention, Hotel Statler, Washington, D. C., June 21-23.

Pennsylvania Water Works School, State College, Pa., June 26-30.

Ohio Sewage & Industrial Wastes Treatment Conference, Hotel Gibson, Cincinnati, Ohio, June 28-30.

American Society of Civil Engineers, annual convention, Royal York Hotel, Toronto, Ont., July 12-14.

FASTER PAVING... LOWER COSTS with GM DIESEL POWER

ON 22 miles of U. S. Route 81 in Kansas, these two GM Diesel-powered Koehring 34-E Twinbatch pavers were used by Koss Construction Company of Des Moines. They poured 2800 feet of 22-foot pavement in one 10-hour run. Slab was uniform 9-inch thickness, mesh reinforced.

In another period of 4 consecutive days, their crews paved 2 full miles. They completed the entire 285,000-sq.-yd., 22-mile paving project in 12 calendar weeks.

Records show these crews consistently poured 1000 batches per 10-hour day—a tribute to the men, the equipment and the power.

Because General Motors Diesels are 2-cycle engines, they deliver power at every piston downstroke. So the power flow is smoother and acceleration is faster under load. The engines are more compact, easier and more economical to maintain.

No matter what kind of work you do, if you want sturdy, dependable, money-making power, it will pay you to specify General Motors Series 71 Diesel engines for new equipment or for repowering old.

Kansas Lowest in Concrete Pavement Construction Costs

A recent study released by the Bureau of Public Roads reveals wide differences in the cost of building concrete pavement.

Kansas, Texas and Michigan costs were lowest. Because of the difference in thickness of pavements in various parts of the nation, the comparison of construction costs was made on the basis of a square yard one inch in thickness.

The cost varied from 36.1c per sq. yd. 1 in. in thickness in Kansas to $1.076 in Nevada. Michigan's cost was 36.8c. The national average cost is 42.1c. In Illinois the cost is 48c; Ohio 44.7; Pennsylvania 51c; Indiana 45.3c; Wisconsin 43.6c; and Kentucky 56.2c.

Reprint from—
ROADS AND STREETS
February, 1950

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GENERAL MOTORS

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GM GENERAL MOTORS DIESEL POWER

1 speed 2 long jaws 3 long stroke

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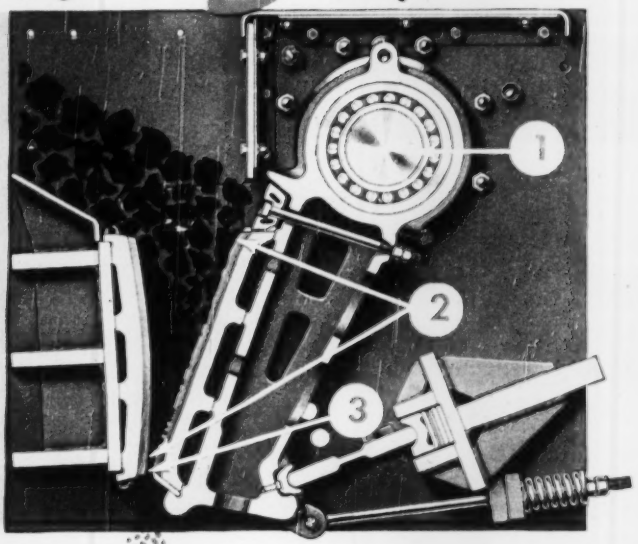

to put the maximum amount of rock through a jaw crusher

A-W design takes full advantage of these basic requirements. That's why these heavy-duty crushers turn out so much rock.

. . . and that's one big reason for the uninterrupted flow of material through the crushers and over the screens and conveyors of Austin-Western portable plants. No bottlenecks . . . no delays . . . just constant, high speed production.

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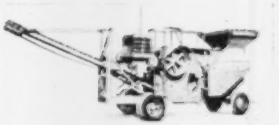
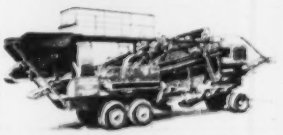
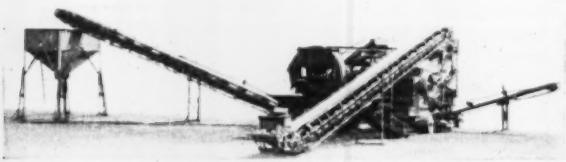


"61"—For the smaller jobs where accurate grading of finished product is not required. Simple . . . economical . . . easily moved.



"201"—High output, portable gravel plant capable of producing especially large amounts of ¾" and smaller product.



2-UNIT AND 3-UNIT PLANTS—Higher production than that of a single unit plant, thanks to larger crushers and multiple screens. Deliver several sizes of finished product.

"101"—For contractors or counties needing extra large amounts of material. Equally useful in gravel and quarry service.

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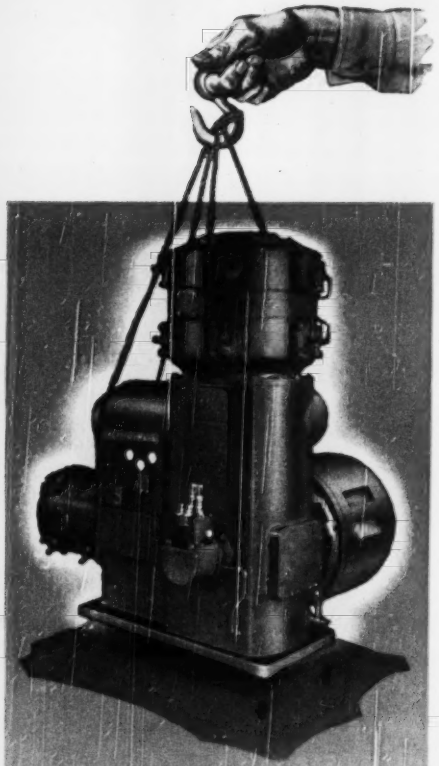

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Built to meet your exacting specifications for a heavy-duty unit from 125 to 350 hp . . . 80 to 125 psi pressures

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9. **Wide range of sizes** . . . 125, 150, 200, 250, 300, 350 horsepower for 80-125 psi discharge pressures.

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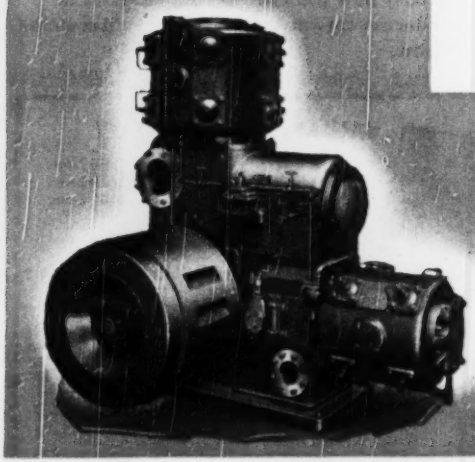

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THE CONSTRUCTION WEEK

POOR BUSINESS?—Chicago area contractors rank way down—60th among 70 business fields—in percentage of profit. At that rate, G. C. Kiddoo, vice-president of the First National Bank of Chicago, told the Chicago chapter of the AGC, contractors might well put their money into securities and go fishing.

GOOD BUSINESS?—Washington will pour forth plenty of optimism on business prospects this month and next, say close observers of the President's Council of Economic Advisers. Outlook for the second half of 1950 is continuing on an uptrend that is expected to bring the year's totals above 1949 figures. Credit is to be assigned President Truman for, among other things, helping along the home-building boom.

FILE AND FORGET DEPT.—Los Angeles—which thought it might have found a source of additional revenue—has tabled the idea of returning to the old method of assessing the municipal Department of Water and Power on the basis of taxation as a privately owned utility. At present, the utility pays 5% of gross income not to exceed the last computed earned surplus figure. Investigation showed the utility paid $3,572,000 to the city. Although under the tax and franchise fee arrangement it would have paid $4,105,331, city councilmen decided the difference wouldn't warrant the change.

UNEMPLOYMENT DOWN—The Department of Labor, which a year ago saw a gloomy picture of rising unemployment, saw brighter tints last week. The department, in fact, looks for a 60,000,000-worker force by summer.

NEVER DO TODAY. . .—No administration proposal to merge the civil functions of the Corps of Engineers (flood control and rivers and harbors work) with the resource development agencies of the Interior Department (more specifically, the Reclamation Bureau) will go to Congress this year. President Truman, who supports such a merger, wants too many other things from the existing Congress to risk sending so controversial an issue to the Hill this summer. But the way things stand now, such a proposal definitely will be sent to the Eighty-Second Congress early next year. Insiders say the precise details of the plan just aren't to be had right now. But they add that it's the Engineers who'll suffer, not Interior. And the Hoover Commission proposal for an independent Board of Engineering Review is to be included in the new set-up. Despite any changes this fall's elections may make in the forth-coming Congress, it's a pretty safe guess that there'll be some violent opposition awaiting the proposal when it reaches the Hill next year.

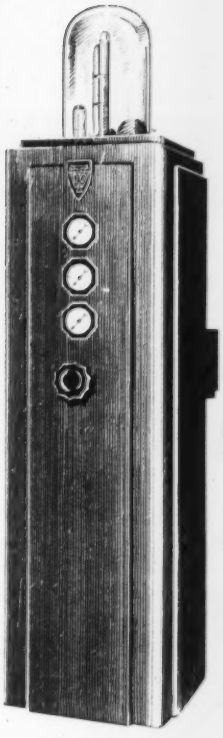
FLOOD READINESS—Reclamation Bureau has a long string of reservoirs—from Wyoming west—ready for whatever major flood threats may develop in the Columbia River watershed this season. Cooperating with the Corps of Engineers and the Bonneville Power Administration, USBR already has drawn down Grand Coulee reservoir by 900,000 acre-ft, will release 375,000 acre-ft more. This could cut 1.4 ft off the stream's crest at Vancouver if the timing works out precisely. Elsewhere, on Columbia tributaries, there are 330,000 acre-ft available now in the Yakima reservoir and 220,000 acre-ft more to be had at American Falls, on the Snake. Jackson Lake, high in the Wyoming mountains (origin of the Snake) Cascade, Deadwood, Anderson Ranch and Arrowrock Reservoirs, on the Snake or its tributaries, have 930,000 more acre-ft of available storage. All this storage space could cut the Columbia crest, if the filling of the reservoirs and the incidence of the crest can be timed correctly.

METER MIXUP—Milwaukee, which uses water meters as an effective tool to cut water wastage, found suddenly that all wasn't too well with the scheme. Two city aldermen discovered there is a waste—of constituents' money. Works like this: To replace a water meter, you must employ a master plumber. He turns in your application at City Hall. The city puts in the meter—either one it sells or one supplied by the plumber. The plumber pays the city $18 for the city meter, and $2.50 for the installation. And then, with nothing in the job but some paper-shuffling and a short-term $21 investment, the plumber is then free to charge what he can get—sometimes as high as $40 to $45. The home-owner may save water—but he pays.

D (FOR DRIVER) DAY: JUNE 18—The teamsters union figures that what was good for business in 1949 will be just as good this year. That's why its agents will be stopping your truck drivers June 18 in a new membership drive. Such tactics brought the union 30,000 new members last year, and 1950's goal is 30,000 more (which would give the union over 1,000,000 members). Delegates to a recent conference in Chicago were told: Treat the drivers courteously, but make them join—or get the money if they're members but delinquent in dues.

WALLACE & TIERNAN CHLORINATORS *are*

Standouts in any Plan



AN OIL REFINERY IN TEXAS needs cooling water chlorination.

A PAPER MILL IN WISCONSIN requires white water slime control.

A SWIMMING POOL IN CALIFORNIA wants chlorination to guard against water-borne disease.

A SEWAGE PLANT IN INDIANA needs chlorination for disinfection.

A CAMP IN VERMONT wants to sterilize its well supply.

A POWER STATION IN FLORIDA asks for chlorination to improve heat transfer in condensers.

Whenever and wherever the plans call for chlorination, Wallace & Tiernan Equipment stands out as the first choice of engineers and architects all over the country.

The reasons for this preference aren't hard to find because smart buyers know that with Wallace & Tiernan Equipment they get:

WIDE SELECTION—Wallace & Tiernan Chlorinators and Hypochlorinators come in a variety of models and sizes handling from ounces up to 3 tons of chlorine daily.

PROVEN EQUIPMENT—Manufactured in a modern, precision-conscious plant, every piece of Wallace & Tiernan equipment is thoroughly tested (before leaving the factory) for the actual job conditions under which it will operate.

EXPERT DESIGN—All Wallace & Tiernan equipment is the product of expert development by a top notch research group specializing in chlorine and chemical control equipment. This is the same group that has pioneered such famous developments as the Visible Vacuum Principle, Break-Point Chlorination, and Residual Recording during the last 35 years.

SERVICE—Wallace & Tiernan's nationwide service organization is ready to solve bacteria-induced water treatment problems, whatever they may be.

Call your nearest Wallace & Tiernan Representative for your next job involving chlorination. He will be glad to help you.

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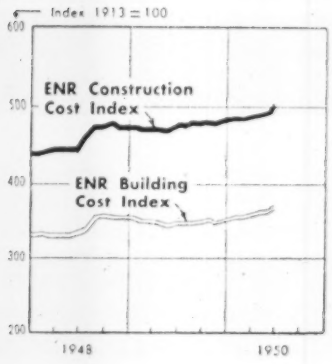
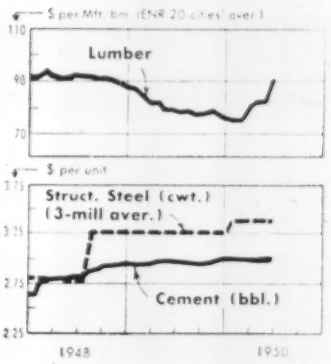
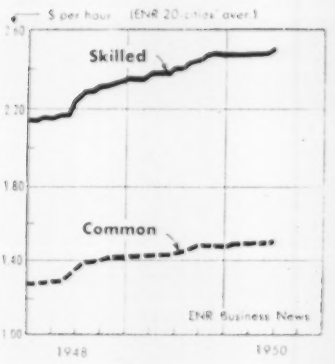
S-60

JUNE CONSTRUCTION BUSINESS REPORT



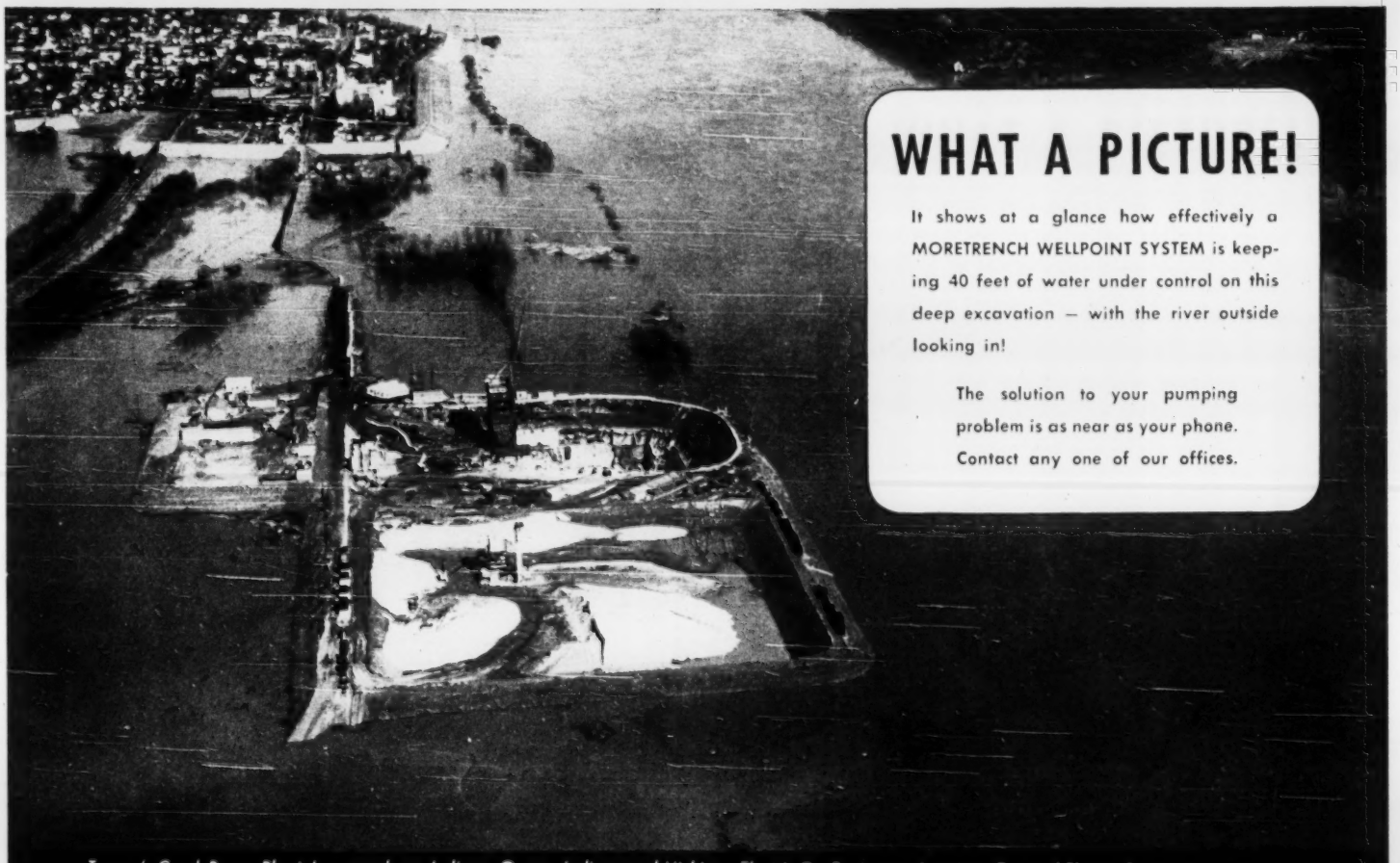




ENR INDEXES (1913 = 100)	June '50	May '50	Change	June '49	Change
Construction Cost	506.45	496.55	+ 1.9	473.78	+ 6.9
Building Cost	372.96	364.27	+ 2.4	349.28	+ 6.8
MATERIAL PRICES (20-cities' average)					
Cement, bulk, per bbl	2.965	2.961	+ 0.1	2.960	+ 0.2
Structural Steel, 3-mill aver., per cwt	3.400	3.400	0.0	3.250	+ 4.6
Sand, per ton	1.968	1.968	0.0	1.978	— 0.5
Lumber, 2x4 Fir, per M ft. bm.	98.974	91.953	+ 7.6	86.382	+ 14.6
Lumber, 2x4 Pine, M ft. bm.	82.433	78.000	+ 5.7	73.803	+ 11.7
Common brick, per M	28.250	28.087	+ 0.6	27.769	+ 1.7
Ready-mixed concrete, per c.y.	10.333	10.318	+ 0.1	10.205	+ 1.2
Structural Clay Tile, 3x12x12 Per M	132.900	132.900	0.0	131.923	+ 0.7
WAGE RATES (20-cities' average)					
Common	1.528	1.511	+ 1.1	1.441	+ 6.0
Skilled (aver. 3 trades)	2.517	2.485	+ 1.3	2.394	+ 5.1
Bricklayers	2.783	2.756	+ 0.9	2.619	+ 6.3
Structural Ironworkers	2.478	2.450	+ 1.1	2.346	+ 5.2
Carpenters	2.289	2.249	+ 1.8	2.209	+ 3.6

	May 1950	May 1949	Change	Five Months 1950	Five Months 1949	Change
CONTRACTS AWARDED (thous.)						
Total U. S. (ENR reported)	$931,153	$581,709	+ 60	$4,411,346	$3,043,841	+ 45
Private	192,953	233,959	— 18	2,506,314	1,455,756	+ 72
Public	738,200	347,750	+ 26	1,905,032	1,588,085	+ 20
Federal	138,972	51,245	+ 95	699,880	433,943	+ 61
ENR Constr. Volume Index, '13 = 100	404	275	+ 47	371	264	+ 40
NEW CONSTRUCTION CAPITAL						
Total	485,825	548,526	— 11	1,892,590	2,297,442	— 18
State & Municipal Bond Sales	329,745	305,216	+ 8	1,141,414	1,119,745	+ 2
Corporate Security Sales	156,080	243,310	— 36	751,276	1,087,697	— 31
Federal (non-federal work						
Federal (federal work						

MATERIAL SHIPMENTS & LABOR SUPPLY	April M / March M	April Y / March Y	Change	Four Months / Three Months	Four Months / Three Months	Change
Cement, thous. bbls., Bu. of Mines	14,613 M	14,539 M	+ 1	33,981 Y	32,429 Y	+ 5
Fabr. Struc. Steel, thous. tons, AISC	155 A	179 A	— 13	327 Y	661 Y	— 51
Lumber, mil. ft. bm., NLMA	3,343 M	2,526 M	+ 32	8,881 Y	6,659 Y	+ 33
Lumber Prod., mil. ft. bm., NLMA	3,091 M	2,656 M	+ 16	7,941 Y	6,947 Y	+ 14
Contract Const. Employ., thous., BLS	2,042 A	2,046 A	— 0.3	Av. 1,930 Y	Av. 1,981 Y	— 2



WHAT A PICTURE!

It shows at a glance how effectively a MORETRENCH WELLPOINT SYSTEM is keeping 40 feet of water under control on this deep excavation — with the river outside looking in!

The solution to your pumping problem is as near as your phone. Contact any one of our offices.

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ROCKAWAY
NEW JERSEY

Bluestone Bridge Failure

IN THE UNFOLDING STORY of engineering progress the most disappointing episodes relate to unsolved failures. Everything is lost, nothing gained.

Such an evaluation must apparently now be placed on the failure in March, 1949 of the Bluestone River bridge in West Virginia. Despite painstaking investigation, to which the contractor and all others involved gave whole-hearted support, all findings have proved inconclusive as to the reasons for the failure. Design and erection stresses were found to be correct. Erection procedure was that customarily and successfully followed on similar structures. And the quality of steel met all specified requirements. Yet the fact remains that a collapse occurred when 232 ft. of trusses, floor steel and wind bracing had been cantilevered beyond the supporting pier. Eyewitness accounts declared there was little or no wind, nor any unusual extraneous loads on the cantilevered steel.

Most bridge failures of the past, when the causes were determined, have led to improvements in design and construction techniques. That is not to be the case with the Bluestone River bridge failure. It can, however, serve as a warning against any relaxation of the care with which designers handle their calculations, steel manufacturers watch the quality of their product and bridge erectors plan and carry out their operations. Somewhere in this chain something was missed at Bluestone. It might be missed again—or with equal probability this particular cause of failure may never recur. The lesson from Bluestone, therefore, is for heightened respect for the meticulous care and the minute analysis that every engineering job demands. Dedication to this principle is about the only way to increase the odds against mysterious failures.

Civic-Minded Professionals

ARE PROFESSIONAL MEN as a group constitutionally lacking in a sense of civic responsibility? That question is raised by two wholly unrelated but curiously similar statements made at professional meetings in recent weeks. Lester L. Bosch of the firm of Jackson & Moreland, speaking at a meeting of electrical engineers, said: "A count of noses seems to find Mr. Engineer not represented in proportion to his potential strength on neighborhood civic committees not in the thousand and one other activities of city, state and nation." At a meeting of the American Medical Association, Louis Bauer, chairman of the association's trustees, characterized as disgraceful the fact that in one Midwest city only 35 percent of the doctors had registered and only 23 percent took the trouble to vote at the fall elections.

It readily could be that the trouble is constitutional, that the type of man who seeks professional training has a mental make-up that gets no satisfaction out of the give and take of working on civic committees. In the case of physicians, their failure to exercise the franchise has a very real danger for that profession. Dr. Bauer told his hearers that if 20 more radical congressmen are elected this fall and a few more radical senators, the socialized medicine fight will be over.

Engineers have no such immediate problem on their hands, yet they could have at almost any time. Anything, therefore, that can be done to stimulate greater civic consciousness on the part of engineers, should be a first order of business on the part of state and national engineering groups.

Service Charges For Financing

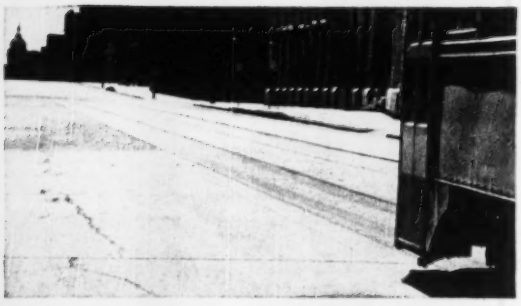
IT'S SO SIMPLE: Cities everywhere are pinched between mounting public works needs and severly limited funds for financing them. The public clamors for streets, schools, airports and sewers—often without giving a thought to how they will be paid for. Yet their cost must be met, and it begins to look as if Mr. Citizen is going to have to pay for his projects as he uses them—more and more.

Sewer-service charging (about 430 cities use it) is being given a big boost in New York City. Mayor O'Dwyer has called upon the city council to approve a service charge that will permit the city's vast sewage disposal program to continue without interruption.

The mayor's plea—for acceptance of sewer charges—was made at the corner-stone ceremonies for the new Owl's Head treatment plant in Brooklyn. Without this facility, untreated sewage will continue to be wasted on Coney Island's beaches. And without additional funds from some source outside the city's strained and tax-limited debt structure, similar plants in the program—to cost more than $100 million—will have to be postponed. Such postponement, in addition to the obvious disadvantages, would run afoul of orders of the Interstate Sanitation Commission to clean up New York's surrounding waters.

The cost to avert this situation is small—about 40¢ per residence per month. Collected as a percentage of the water bill, it would be relatively painless to the consumer and inexpensive to administer by the city.

Water-service charges have long been accepted as proper and necessary. That sewer charges have not been considered in the same light is one of the paradoxes of municipal management. New York's efforts to institute such charges will, therefore, command more than ordinary interest. They may accelerate a trend toward service charging that will have a marked effect on municipal financing and sanitation progress.



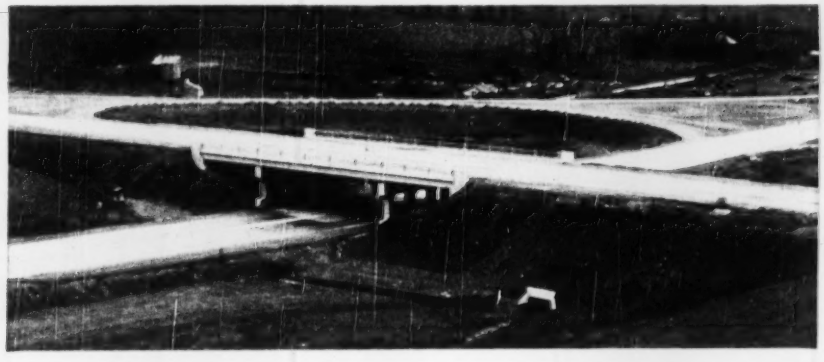
Ten Years Ago...

this test paving was laid in Minneapolis—the first commercial use of Atlas Duraplastic air-entraining cement. Badly scaled background section was made with regular cement. Foreground concrete was laid at the same time with Duraplastic cement. Here are both sections, photographed ten years later, after ten severe winters, heavy applications of de-icing salts and many freezing-thawing cycles—convincing proof of Duraplastic concrete's lasting durability. Longitudinal structural crack shows some raveling. Note perfect transverse joint.

A Decade of ATLAS DURAPLASTIC AIR-ENTRAINING PORTLAND CEMENT

Today...It's "DURAPLASTIC* throughout" on more and more paving jobs

Interchange underpass connecting parkway with Route 66 near Greensburg, Pa. Atlas Duraplastic used throughout. Contractor: W. L. Johnson Construction Company, Hicksville, Ohio.



GROWING NUMBERS of engineers and contractors specify Atlas Duraplastic cement for all types of concrete construction in modern highway paving. For straight paving, and for underpasses, overpasses, bridges—more and more—it's "Duraplastic throughout."

That's because experience has proved that Duraplastic air-entraining portland cement makes more durable concrete, that it fortifies concrete against the effects of freezing and thawing—renders it highly resistant to the scaling action of de-icing salts.

And Duraplastic cement requires less mixing water for a given slump, makes concrete more plastic, more cohesive, more workable and more uniform. Bleeding or water-gain and segregation are minimized. The concrete dumps, spreads and screeds easily, permits finishing closer to paver, allows earlier protection for curing. And in structural work, surface appearance is improved.

Duraplastic cement makes better concrete at no extra cost. It provides the precise amount of air-entraining agent interground with the cement for satisfactory field performance. It complies with ASTM and Federal Specifications, sells at the same price as regular cement, calls for no unusual changes in procedure.

Send for free new booklet, *"A Decade of Atlas Duraplastic Air-Entraining Portland Cement." Write to Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.*

* * *

Offices: Albany, Birmingham, Boston, Chicago, Dayton, Kansas City, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Waco.

**"Duraplastic" is the registered trade mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.*

ATLAS DURAPLASTIC

TRADE MARK REG. U. A. C. CO.

AIR-ENTRAINING PORTLAND CEMENT

MAKES BETTER CONCRETE AT NO EXTRA COST

NBC SUMMER SYMPHONY CONCERTS—*Sponsored by U. S. Steel Subsidiaries. Sunday Evenings, June to September*

ENGINEERING NEWS-RECORD

JUNE 8, 1950 VOL. 144, NO. 23

Hungry Horse design change helps Northwest power pool

USBR General-Shea-Morrison switch from reinforced concrete to steel for powerhouse—Generating capacity to come in on schedule in 1952 as a result

A design change in the Hungry Horse Dam powerhouse that will—at the cost of $155,000—get a substantial new block of power on the line for the Pacific Northwest a year earlier than expected has been approved by the Bureau of Reclamation.

The change involves a very simple matter. It will make the powerhouse a steel-frame structure with a metal roof, rather than the previously planned reinforced concrete structure.

But it will permit work through the coming winter, so that two powerhouse cranes will be ready for operation by July 1, 1951, and operation of power producing units a little more than a year later (by October, 1952). Although that's about what has been scheduled all along, it will be actually a lot sooner than power supply experts—and the contractor—believed would be possible.

Importance of the move is great for the power-short Northwest, where reserve capacity has been skimpy or nonexistent for several years. Until now, power supply people had expected the next major additions to power supply in the area, after the final units in Grand Coulee's second powerhouse next year, would be two 70,000-kw units at McNary Dam in 1953.

• **Badly needed**—How seriously the Northwest needs the earlier delivery of new capacity is demonstrated in the most recent power supply forecast of the National Security Resources Board.

This report shows that, under median water conditions, the region will have a deficit of 191,000 kw or 3.2% of anticipated peak load in 1952 (a bad water year would cause a 14.2% deficit). There are a number of qualifications of course. Such a forecast (even though done by the nation's foremost experts) is an educated guess, three years in advance, as to what's going to happen. Also NSRB's figures aren't the latest available. Its survey is based largely upon a comparable study conducted twice yearly by the Edison Electric Institute (a trade association). NSRB's current survey is based on EEI's October, 1949, survey, and another has been completed since then, showing a 5.9% margin for the region in 1952.

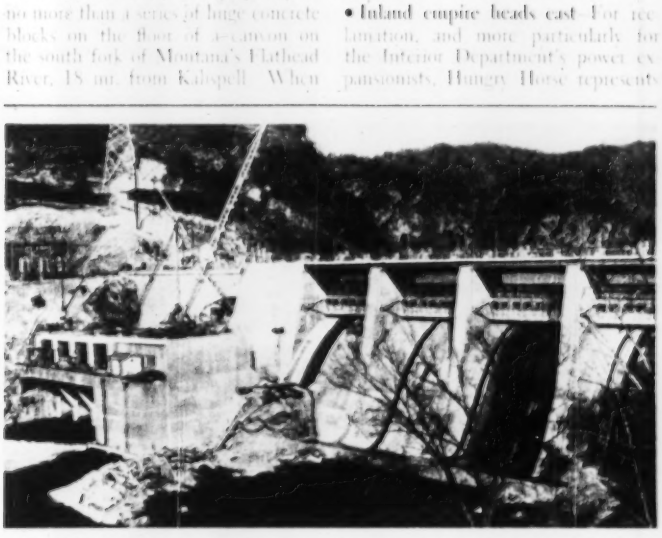
• **How it's done**—With the changeover to a steel-frame structure, contractors will be able to work through cold weather, when concreting operations would normally have to be shut down. Working over the winter, workmen will get the two 290-ton traveling cranes in the powerhouse ready for operation by July 1, 1950, so that work can start on erecting the first two turbines. By spring of 1952, the powerhouse should be ready for installation of generators, first of which should be operating by October, 1952, and the second by December.

At the moment, Hungry Horse is no more than a series of huge concrete blocks on the floor of a canyon on the south fork of Montana's Flathead River, 18 mi. from Kalispell. When it's done, it will be the world's fourth largest and highest concrete dam, 520 ft high, with 3,000,000 cu yd of material.

The Hungry Horse construction contract (at $43,431,000 the second largest in USBR history) calls for water storage to start in 1951. There are to be 1,000,000 acre-ft available by the end of 1952, (ultimate capacity: 3,500,000 acre-ft). That would let two 71,250-kw units develop about 125,000 kw.

• **It's a money saver**—To all its impressive physical statistics, Hungry Horse will add a new one. It'll be the Bureau's first major use of pozzolan, (ENR May 12, 1949, p 55) and it figures to save $4,750,000 by displacing costlier cement. Pozzolan is a soot-like fly ash. Decision to use it so extensively came after years of research. It may be that Bureau engineers will OK the use of as little as half a barrel of cement per cu yd of mass concrete. The Bureau's existing record for a mass concrete dam is one barrel per yd at Grand Coulee and Chief Engineer J. N. McClellan says you can look for a better concrete and a better dam as a result. Delivered at the project, pozzolan will cost $10 per ton less than the cement it displaces.

• **Inland empire heads east**—For reclamation, and more particularly for the Interior Department's power expansionists, Hungry Horse represents



OLD DAME, NEW TOP—Wilbur Dam—on the Watauga River, in northeast Tenn.—has been given a new top by the Tennessee Valley Authority. The old dam, formerly privately owned, had its crest cut down and four 15x40-ft radial gates installed below a new operating bridge. A 7,000-kw unit is going into an extension of the old powerhouse. Watauga Dam has been finished by TVA upstream. (ENR staff photo)

a new thrill from an old dream. The dream: Full development of the 25,000,000 kilowatts of power which such people as Paul Raver insist can be developed economically from the main river and its tributaries. Raver, once an Illinois economist, utility regulator and university professor, has become a St. John who does more than just preach in the Pacific Northwest's wilderness. As head of the Bonneville Power Administration, Raver long has been plugging for the full Columbia development. As a consequence, you can find old-line Reclamationists, as well as private power people who also fear him.

For an example of what he means, Raver need point no farther than Hungry Horse. Its capacity will be limited to 285,000 kw, by no means all of it firm. But just look at what this dam can do for the Columbia's energy potential. When completed it can add 554,000 kw to the firm power capacity of downstream plants—Grand Coulee, (USBR) Rock Island, (Puget Sound Power & Light) Bonneville, (Corps of Engineers) and others. If full development of the Columbia is ever achieved, Hungry Horse will be responsible for 811,000 kw of downstream firm capacity, merely by storing early-season, high-water flow and sending it off downstream in winter, when the main stream's flow is at its lowest and its power demand highest.

• **CVA here's a key**—Hungry Horse is the first realization of this fabulous dream which has entranced the Interior Department for a decade or more. In existence today, Bonneville Power Administration has Grand Coulee and Bonneville Dams on the main stream, with McNary building and Chief Joseph on deck. But Hungry Horse is the first venture back into the hills, the headwaters whence will have to come much of the kilowatts and even more of the regulative stream flow which will make a fully developed Columbia a possibility.

Perhaps even more disturbing, the very existence of Hungry Horse means that some day it will be another trump in the hand of those who clamor for a Columbia Valley Authority.

Painting Research Council

John E. Jackson, treasurer of the American Institute of Steel Construction, announced on May 11 the formation of the Steel Structures Painting Council, consisting of representatives of the associations and organizations concerned with the manufacture of, specifications for, and use of paints and other coatings for the protection of steel surfaces.

INTERNATIONAL STANDARDIZATION—Albert Caquot, new president of the International Organization for Standardization, took office recently for a term of three years, it is announced by the American Standards Association, 70 E. 45th St., New York. ASA, a member of ISO, represents the United States, one of 29 cooperating countries. Mr. Caquot is a pioneer in standardization work in France and has been associated with the Association Francaise de Normalisation (AFNOR), the French national standards body, since its formation in 1926. He has been president of AFNOR since 1943 and was vice-president for the 10 preceding years. Professionally, Caquot is a civil engineer and has done distinguished work in the field of construction.

Homebuilding sparks new construction mark

Federal agencies' "put-in-place" figures reached $1.9-billion last month—exceed '48, '49

Construction activity set a new record in May, exceeding even the seasonal peaks recorded in the fall of 1948 and 1949. That was the finding, last week, of the U.S. Commerce Department and Bureau of Labor Statistics. (See p. 30)

New construction valued at more than $1.9 billion was put in place in May. That total was 14% above April, 1950, and 25% over May, 1949.

• **Private homebuilding leads**—Almost half the advance over April came from private homebuilding. It represented more than three-fourths of the increase over May, 1949). Volume was estimated at $825 million, 15% above the April volume and 56% ahead of the comparable month last year.

Highway construction also rose substantially, and nearly all types of construction expanded seasonally. Factory-building reversed its three-year downward trend. Store and other commercial construction also showed larger than-seasonal gains.

Private construction accounted for $1.4 billion of the May volume, up 12% over its April figure, 27% over May, 1949. Public construction hit an estimated $531 million, which is 19% ahead of April, 15% above May, 1949. Highway construction boomed, achieving a 52% increase over April, and a 9% jump over the comparable month last year. A substantial increase was registered also in reclamation and flood control work.

• **Ahead for the year**—The first five months of 1950 saw all construction move 21% ahead of the volume for the comparable period in 1949. It reached a total of almost $8.1 billion in May, of which $6 billion was private building. That's a gain of 22% on the comparable 1949 figure. It results largely from the 31% increase in private homebuilding.

Contributing most to the 19% advance achieved by public construction during the first five months of the year were highways, schools, hospitals and public housing.

A 10-year-old water dispute settled in California

Five damage suits against the Southern California Metropolitan Water District filed by landowners in the Hemet, San Jacinto and Perris areas of Riverside County will be withdrawn following an agreement with the Metropolitan district ending a 10-year-old dispute.

Landowners in the area had charged water from their San Jacinto watershed drained into the 13-mi San Jacinto tunnel of the Colorado River aqueduct through uncontrolled underground seepage.

Metropolitan agreed to pay $250,000 to be used for the construction of a San Jacinto distribution system, while residents in the area agreed to hold an election to form their own water district. The district will then be annexed to the Metropolitan district. Metropolitan directors have already approved annexation after the local district is formed.

The new district will be permitted to connect with the Colorado aqueduct at three points, with the Metropolitan district paying the cost of one connection. An amount of Colorado River water equivalent to all future seepage into the tunnel will be delivered free to the new district. Additional water will be purchased at $10 an acre-foot. Engineering surveys fixing the boundaries of the district have been completed.

LIGHT SHELTER—This aluminum dome has been erected at the Canadian International Trade Fair, Toronto, by Aluminum Construction, Ltd., of England. It's 82½ ft in dia, cost $11,000, and can be erected by six men in three weeks. It's built of hollow-square aluminum ribs in compression carried on a thrust ring. Sheeting is attached with self-tapping screws, with 4-in. wide plastic strips for waterproofing joints. Columns are set in concrete and the two-ton dome bolted to them through the thrust ring. Domes of 600-ft dia can be erected. This one covers 5,340 sq ft. C. Howard Crane, Detroit and London, was architect.

USPHS will issue first basin reports this summer in anti-pollution drive

Program calls for 350 reports of two kinds, covering all of the United States — Interpretive series designed for thought-leaders

Swinging into the main phase of the national pollution control campaign, the U. S. Public Health Service this summer will issue the first river-basin reports of an extensive series that will cover the entire country in the next two years. In all, PHS plans some 350 reports, of two different kinds—one addressed to professional people, the other to laymen.

Careful planning is back of the decision to produce two types of reports. For engineers and technicians who will carry out pollution abatement programs in the states and localities, the health service will issue comprehensive technical reports on 260 separate river basins. These documents will collate all available data on existing conditions and will propose basin plans and standards agreed upon previously in consultation with the states and localities to attain desired improvement of the streams.

• **Opinion leaders sought**—Along with these reports will be issued a parallel set of publications prepared by skilled writers for an entirely different group of readers—the opinion-forming laymen. Documents of the latter type, known as interpretive reports, will present in well-written, readily understandable form the information needed by the public-spirited citizen who is interested in stream pollution problems.

Public education has long been recognized by engineers as an essential preliminary to effective action on pollution control. The interpretive reports for laymen are designed to fill this basic need by giving civic leaders, public officials and other interested citizens the fundamental facts on each river basin and on the proposed corrective program.

Reports addressed to the layman generally will cover a broader area than the specific river basin documents for the use of the professional man. On the average, two to three river basins will be included in each of the interpretive reports.

Gathering of primary data to be used in the technical reports has been under way for months. With the cooperation of the states, interstate commissions and other public bodies, the ten field offices of PHS are bringing together all available information on the nation's streams and existing pollution conditions.

• **Data assembled this year**—By Dec. 31, these data will be assembled in 15 or 16 reports for as many segments of the country, blanketing the entire nation. The comprehensive summaries may include some recommendations for corrective measures.

These technical reports map out the river basin programs in detail. They consist of four parts. First, the report on any river basin gives a complete inventory of existing pollution and of corrective measures already in operation. Second, it develops a plan—or a set of guide lines—on the water uses desired for the stream at some reasonable time in the future.

• **States consulted**—This second determination is a critical one. Like all other stages of the program, it is worked out by PHS in close consultation with the states and localities. At every step of its pollution control operations, the PHS staff acts on the basic philosophy that the function of the federal agency is to support and supplement the efforts of the states and localities. That was the intention of the Water Pollution Control Act, as passed by Congress in 1948.

Alternative sets of guide lines for future water use will be offered in some of the technical reports. It then will be up to the states—with their communities and industries—to decide which plan to adopt.

Following the guide lines on water uses, the report will go into the matter of water quality standards to achieve the desired results. This question, too, could be controversial, were it not for the close collaboration in advance between the states and the Pollution Control Division of PHS. Standards in the report will offer broad guide lines for setting up local criteria.

Finally, the technical report will indicate for a river basin the corrective measures that have to be taken to meet the water quality standard recommended. A rough estimate may be included on cost of these measures.

Engineering reports on the river basins will be reproduced in limited number for distribution to professional people, organizations, libraries and public officers who have a direct interest in the technical phases of the basin program. The interpretive booklets, however, will be printed in larger quantities for wider distribution.

Preparation of the river basin reports by PHS is mainly under the direction of Carl E. Schwab, chief of the Pollution Control Division, and Louis L. Warrick, head of the Technical Services Branch in that division. To assist in coordinating the work, Percy Talbot has been put in charge of reports analyses. The pollution control program is under the jurisdiction of Mark D. Hollis, asst. surgeon general.

COMPLETE AT LAST—Bluestone River Bridge has been completed after a delay of six months caused by an erection failure. Truss wreckage may still be seen in the river.

Railroad construction booms in Washington

Hanford atomic plant, McNary Dam job spur new construction, extensive relocation in southeast part of state

Proposed and nearly completed rail line construction is the center of construction interest in southeast Washington.

Scheduled for completion early this month is nearly 7 mi of rail line costing $2,000,000. It will give Richland and the Atomic Energy Commission's Hanford Works a southern freight connection to the Union Pacific and Northern Pacific lines. The new line includes three bridges, a 700-ft multiple steel girder bridge over the Yakima River, a 64-ft single steel girder span over Highway 410 and a 27-ft single steel girder bridge over an irrigation canal. Four piers of the Yakima River bridge are supported on steel H-piling, driven as deep as 40 ft into the river bed.

The new line, as well as three miles of yard tracks, is being built by J. A. Terteling & Sons, Inc., of Boise, Ida.

The proposed construction involves relocating the Union Pacific and Northern Pacific railroad lines between the Snake and Walla Walla rivers. It's necessitated by construction of McNary Dam, on the Columbia River downstream from the entrance with the two tributaries. The Union Pacific has branch lines along each tributary. The Northern Pacific lines are somewhat inland.

Railroad officials and the Walla Walla District office of the Corps of Engineers have reached tentative agreement on relocation plans which avoid some 10 mi of duplication.

Road officials retire in Calif. department

F. G. Grumm, deputy highway engineer, F. W. Haselwood and E. Q. Sullivan, division engineers to leave

Fred G. Grumm, deputy California highway engineer, will retire July 1 after 27 years' service. During that period, he has been active in the American Association of State Highway Officials.

Fred W. Haselwood, district engineer at Redding, retired June 1, and E. Q. Sullivan, district engineer at San Bernardino, will retire Aug. 3.

Grumm became assistant highway engineer in 1922, holding that position and that of assistant division engineer at Fresno until 1923, when he became engineer of surveys and plans. In 1943, he became assistant state highway engineer, assuming his present post four years later. After schooling in Wisconsin and Michigan, he began his engineering career with the San Diego Cuyamaca and Eastern Railway. He worked thereafter for the San Diego and Arizona Railway and the first San Diego County Highway Commission.

Haselwood's state career began in 1911, investigating water rights. He joined the Highway Division in 1912, transferred to its bridge department in 1923 and became a division engineer in 1924. Sullivan joined the division in 1914, and has been in charge of the San Bernardino district since it was organized in 1923.

Haselwood served the Western Pacific and Santa Fe Railroads and practiced privately before joining the state. Sullivan was construction engineer for Paramount Pictures before joining the division.

Bluestone Bridge rebuilt but failure is unsolved

What caused the failure last year of the Bluestone River Bridge, near Hinton, W. Va. will go down in the annals of bridge construction as an unsolved mystery. An investigation of the accident, just completed by the Virginia Bridge Co., the contractor, and the American Bridge Co., a sister subsidiary of the U. S. Steel Corp., reveals no known cause of failure. The tragedy occurred on March 31, 1949, when 10 panels (232 ft) of cantilevered trusses in Span 3 collapsed without warning, killing 5 workmen (ENR April 21, p 12 and May 19, 1949, p 24). (See also p 21, this issue.)

Thorough tests proved that the steel used was in accordance with the chemical and physical requirements of the West Virginia state highway department specifications. Stress computations also were found to be correct, and the erection scheme was the same as that used successfully on a number of similar structures.

Opening of the bridge, scheduled for next week (June 15) was delayed 6 months by the accident. Erection procedures for Spans 1, 2 and 3 were revised, due to the delay in fabricating new steel for Span 3. Steel for Spans 1 and 2 arrived on the job before Abutment 1 was completed. Consequently, an erection bent was placed 40 ft from Pier 1, in Span 2, permitting "balanced-cantilever" erection over Pier 1 and the bent, extending back to Abutment 1 and forward to Pier 2. Three panels of trusses then were cantilevered past Pier 3 toward Pier 2, stopping at the end of the cantilever arm in Span 3. (Spans 4 and 5 had been erected before the accident.) Final closure then was made at this point with the remaining 9 panels in Span 3 being cantilevered past Pier 2. No changes in design were made except those necessitated by the changes in erection procedure.

School bond issue OK'd

Voters in Fairfax County, Virginia, a growing Washington suburb, have approved a $10,500,000 bond issue for school construction. It will build at least 11 new schools and allow additions to 40 more. The program included another $950,000 issue for an addition to the courthouse and jail. The area is regarded as one of the nation's most critical, from the viewpoint of school facilities, because of the rapid expansion of residential areas that has taken place within it since the war. Bonds will be issued periodically as plans are readied.

Bowles urges program on material prices

Tells Connecticut homebuilders that prices must be held, supplies upped to prevent harm to building boom

Increasing materials shortages and rising materials prices have brought the first proposal from a public official that something be done soon to prevent these trends from constricting the construction boom (ENR June 1, p 23).

Connecticut's Governor Bowles has called for a national conference of building materials supply leaders. It's assignment: To set up an allocation system and to boost materials production so as to obviate price increases. His recommendation came at a meeting of about twenty Connecticut home builders called by the state Housing Authority to discuss building homes in the prince range of from $7,500 to $10,000.

"Nobody wants the government to step in to control prices," the former OPA boss told the builders. "It is up to the builders, through their associations, to work with the building materials' supply industry to keep prices down."

Bowles' statement came from a figure deeply involved in one of the strategic 1950 election campaigns. However, his point regarding materials prices and shortages was easy to verify. In Toledo, for instance, builders were far from happy over the second $10 MBBM price boost in May. They wondered what effect it might have upon Toledo and Lucas County's greatest home building boom. At the least, the possibility existed that it might lengthen the time necessary to complete homes. Lumber yards were becoming extremely cautious about deliveries, accepting them on an "immediate delivery" basis only. That kind of buying could slow any boom.

• **Prices up everywhere**—Although lumber is the principal item in short supply right now, other tight spots can be found. Structural steel fabricators, for instance, booked 52% more orders in April than in the comparable month last year. Last month, midwestern steel warehouses raised steel shape prices $4 per ton. The move spread to 12 of 20 major cities by the end of May.

St. Louis reported price increases more general than those of other cities, and it faced a threat of a skilled labor shortage just as numerous large projects were about to reach the construction stage.

Baltimore builders were buying out of town cement, brick and blocks. Cement is coming in from the Lehigh Valley, with a price increase to cover the extra freight. Local brick makers are about three months behind on deliveries and offer no quotes on new business. Concrete and cinder block aren't to be had there either, despite price raises.

Lumber wholesalers, at the end of May, were quoting prices higher than those at the start of the month. Pine prices were rising as fast as those of Douglas fir, too. The latter has reached $100 per M in numerous centers. Distributors expect further increases in the mill price of Southern pine. And Quebec lumber costs face a 5% increase as a result of the forest fires last month at Rimouski and Cabano, which cost about 40 million feet.

Delivered pricing bill sent to White House

Cement and steel supplies in local markets would get a shot in the arm from a bill that went to the White House at the end of last week. The measure aims to clear up confusion and difficulties resulting from decisions made by the Supreme Court on delivered pricing.

Under the proposed law, a manufacturer would be allowed to absorb freight charges on his product in order to compete on a price basis in a local market with another producer whose mill was more favorably situated for delivering to the same market. The bill would require independent action by the manufacturer, without collusion or restraint of trade.

It is a toss-up whether President Truman will sign it. In debate, Sen. Joseph M. O'Mahoney contended that it would not permit return of the basing-point system of pricing. Sen. Paul Douglas and others took the opposite view.

Supporters explain that its purpose is clarification, not modification, of existing laws. Since the Supreme Court handed down its famous decision in the Portland Cement case, and later in the Rigid Steel Conduit case, manufacturers of basic materials have been careful to sell in local markets only on a basis of mill price plus freight. This interpretation has closed local markets to competition from more distant producers.

If the new bill becomes law, it will widen local competition. One result that could be expected would be a flow of cement and steel products from some mills to areas that have experienced shortages. The distant mills, of course, would have to absorb freight costs in order to compete in price with local producers. Mill prices accordingly would have to be adjusted to allow for such freight costs as a producer might elect to absorb.

Supreme Court bans price-fixing licenses

U. S. Gypsum, six other wallboard manufacturers enjoined from any "concerted action" in restraint of trade

In a little-noticed order handed down May 29, the Supreme Court took another stand on the long fought antitrust case against U. S. Gypsum, and six other producers, on charges of using patents to fix prices.

The other companies: National Gypsum Co., Certain-Teed Products Corp., Celotex Corp., Ebsary Gypsum Co., Newark Plaster Co., and Texas Cement Plaster Co.

Its immediate effect:

1. To enjoin U. S. Gypsum from enforcing "in any manner whatsoever" the provisions of its patent licensing agreements with the other wallboard producers that have to do with the fixing of prices or terms and conditions of sale, and

2. To enjoin all defendants from any "agreement or understanding" in restraint of trade in gypsum board by license agreements "or other concerted action."

While such an order might ordinarily be expected to cause a price flurry, both among manufacturers and their customers, the probability is against such a result in this case, Washington observers said. Price fixing provisions of the gypsum licensing agreements have not been in effect for some time. Thus, manufacturers have been free to establish prices without this restraint. Such prices should remain stable, Washington felt.

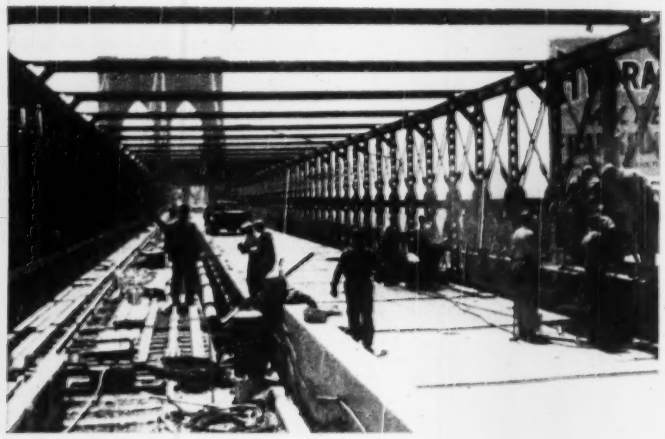
• **Litigation not ended**—The Supreme Court's action was unusual in that it was not specifically requested to hand down such an order.

Both sides had appealed from a lower court ruling. The companies wanted the high court to overrule the lower court's "summary judgment" on the basis that they hadn't had their "day in court." Government attorneys wanted the Supreme Court to go even further than the lower court did in its decree against the wallboard producers.

The Supreme Court denied the companies' appeal. But it agreed to hear arguments and decide next fall whether to hand down a tougher ruling against the companies.

But in connection with these two strictly procedural actions, the court went out of its way to uphold that part of the lower court decision that banned price-fixing specifically, and any restraint of trade generally.

Government lawyers claimed to detect in the language used by the court an unmistakable hint that the court was disposed to go along with them next fall.



IT'S EASY TO GET TO BROOKLYN—Now that an $80,000,000 tunnel links Manhattan and Brooklyn a short distance downstream, (ENR May 25, p 30) New York City's attention swings to the modernization of the Brooklyn Bridge (ENR Nov. 17, 1949, p 28). It's aimed at boosting to 6,000 cars hourly the present capacity of 20,000 cars daily. Trolleys will go to permit a six-lane roadway. At left, workmen place on the old outer truss, which is being deepened, a new top chord, salvaged from the eliminated intermediate truss which set off the trolley tracks from the auto road. At right, they're removing tracks. (Wide World Photos)

Organize California rainmaking firm

Dr. Irving Krick, industrial meteorologist of Pasadena, Calif., has formed the Water Resources Development Corp. to produce rain by silver iodide cloud seeding from the ground.

Krick, who has been operating a long-range weather forecasting service, has been making cloud seeding studies and graphs of potential yields. He uses nationwide 50-year weather charts.

• **Bad weather no problem.** Advantages of the silver iodide generator method, according to Krick, are: Best conditions for seeding are often worst conditions for flying; generators, with an automatic feeding device, can be left unattended for as long as 12 hours; many generators can be placed over an area to take advantage of most favorable topographic conditions; and seeding can be controlled better.

To date, the company has signed survey contracts for areas in northern New Mexico, western Colorado and eastern Washington. It has begun work in Washington on its first rainmaking contract.

Krick distinguishes between survey and delivery.

"It can't be made to rain," he says. "It isn't going to rain anyway. What can be done is to take full advantage of conditions and produce more rain than would normally fall."

• **Coke is the carrier.** Silver iodide is dispersed by burning in a crucible. Particles of foundry coke soaked in silver iodide solution are fed from a hopper. The crucible is started with non-treated coke, reaches 2,500 degrees F before the feeder is turned on. The machine consumes about a pound of impregnated coke per hour, which is blown into the intake gas. Cold air crystallizes the silver iodide. It is borne—and by natural air turbulence, forming nuclei for rain droplets.

Water Resources Development field parties are now surveying a 120- by 200-mile stretch of Colorado range land seeking to determine if material increases in rainfall there can be produced by cloud seeding. A second survey is being made in the company's Pasadena laboratories, where studies of the area's weather are being made.

Pa. Turnpike extension will open on schedule

Despite delays totaling eight days from excessive rain, wet grade and material delays caused by the railroad strike the Pennsylvania Turnpike Commission expects to open its Philadelphia Extension on schedule Oct. 1—the tenth anniversary of the opening of the original road.

Work on the Western Extension, though not nearly so far along as that to the east is progressing. After a letting scheduled for June 20, there will remain only 4.5 mi of road still to be put under contract on the 67-mi addition. Already under contract are two major bridges across the Allegheny and Beaver Rivers, and three viaducts.

New York City gets PHA OK for 3,700 more dwellings

New York City has obtained federal approval for a "substantial increase" from 20,500 units to 24,000 units—in its federal aid, low-rent housing program under the 1949 National Housing Act.

Public Housing Administration approval of this increase in program reservations will enable the city to add four new projects to the 10 already scheduled for the first two years of the program, the city's housing authority announced.

The city's Board of Estimate, meanwhile, has approved "plans and projects" for the Baruch and Washington Houses in Manhattan, the Van Dyke Houses in Brooklyn and the Throggs Neck Houses in the Bronx. It also OK'd condemnation of the site for the Brinkerhoff Houses, in Brooklyn.

Construction of the latter, most advanced of all these projects, is expected to begin this summer. The $29,000,000 project will house 1,595 families. The Baruch Houses, a lower East Side project, will cost about $31,400,000 and house 1,900 families. The Washington Houses, on the upper East Side, will provide 1,500 apartments at an estimated cost of $20,400,000. The Van Dyke Houses will provide 1,450 units at an estimated cost of $19,400,000. The Throggs Neck Houses will cost about $14,000,000, house 1,200 families.

LaGuardia Houses, after the late mayor, was chosen as the name for a proposed new 800-home project.

Cleveland hearing set by water policy group

Water Resources Policy Commission is encouraged by progress of investigation —Numerous reports received

Cleveland has been added to the list of cities in which the President's Water Resources Policy Commission will hold eight regional conferences in June and July.

The commission set these dates for July conferences: Cleveland, July 24; Springfield, Mass., July 25; and Atlanta, July 31. Dates already had been announced for the five June meetings in Sioux City, Spokane, San Francisco, Denver and Fayetteville, Ark. (ENR May 11, p 27).

Commissioners expect the area conferences to produce ideas for the water policy report due Dec. 1. Importance of the regional meetings is attested by plans the commissioners have made to attend the conferences.

• **Will meet at Seattle**—Between the Spokane and San Francisco conferences, the commission will hold a regular meeting in Seattle, June 18-20. Members hope to consult some local groups, but no public session is scheduled there.

Chairman Morris L. Cooke told ENGINEERING NEWS-RECORD that the group is much encouraged by progress of its investigations.

A favorable report on progress of a cooperative study by the Engineers' Joint Council gave added encouragement to the commission. The EJC Water Policy Project is far enough along to assure completion of its findings by the scheduled date, July 1. Eight committees are collaborating on separate phases under an EJC panel headed by W. W. Horner, with Abel Wolman as chairman of a top coordinating committee.

• **75 replies received**—During the last three weeks, replies to the commission's economic questionnaire have been flowing in steadily. The staff was confident last week that a final count would show comprehensive answers from more than 75% of the groups to which the 18 questions were submitted.

Under the commission itself, federal interdepartment committees are studying characteristics of eight or ten river basins, selected for variety in size, location and physical conditions. Commission staff members sit with these study committees. By these diverse investigations, the commission obtains data on all types of river basin characteristics.

Studies are being carried upstream to the smallest headwater basins. Fundamentally, the commission feels, all water resources—as well as all stream problems—stem from these origins. Effects of land use at the headwaters are included in the investigations. To focus public attention on their importance, the commission may put a chapter on small upland watersheds in its report.

WORKS FOR US, NOW—This 450-ton floating crane was captured from the Germans in the last war. Here, the Navy uses it to pick up a 100-ton mobile traction crane which had to be transferred to a new location at California's Long Beach Navy Yard. The smaller crane couldn't be moved by highway without excessive disruption of traffic, so it went by water.

One basic design covers 25 Chicago street bridges

Chicago has begun work on a mass-production bridge project which calls for 25 concrete and steel structures to carry cross streets over the Congress Street Expressway.

First of the series is under construction at Peoria Street, on the city's West Side. Kenny Construction Co. was awarded the contract at $320,000. Low bid for the second, at Halsted Street, was $376,412, submitted by Leininger Construction Co. Design of all the bridges is to be similar.

The three-span, rolled-beam structure at Peoria Street will rest on concrete piers supported by wood piling driven to hard clay. Deck slab will be concrete, 7" thick, resting on nine steel beams 218'3" ft. These beams, the deepest rolled, will be made of three spliced sections.

The expressway will extend eight mi from the Loop to the western city limits at an estimated cost of $80,000,000. Extension beyond the city to the Cook County line will cost $35,000,000 more.

Airstrips lengthened at 10 major airports

Six plan no change in existing facilities —Many runways to extend 7,000 ft or longer—Jet plane needs anticipated

Airstrips are being lengthened at 10 major airports in the country, according to a survey by the St. Louis STAR-TIMES. At six other major fields, including three of four in Metropolitan New York, there are no extension plans.

Five of the six airports which plan no extension of existing strips are sea-level airports. Greater air density at these points makes shorter strips feasible. But one sea-level airport, Miami International, is lengthening its three 7,000-ft strips to 9,400 ft each, anticipating greater use of jet and turbo-jet propelled equipment.

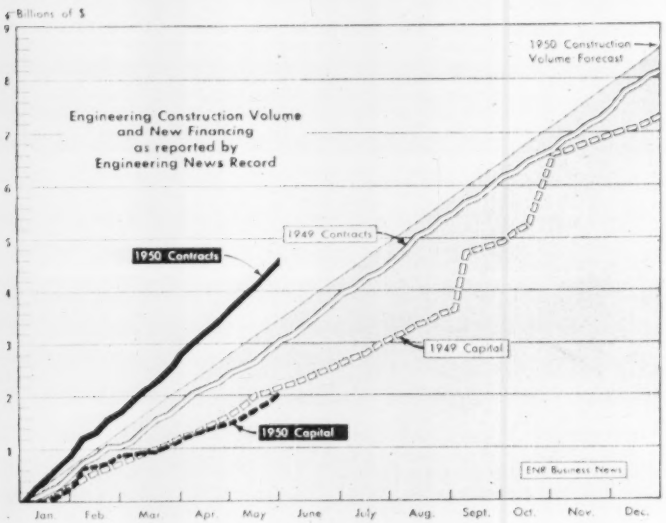
• **10,000-ft strip at Boston**—At Boston's Logan International Airport, a 7,000-ft strip is being extended to 8,000 ft and a 7,360-ft strip to 10,000 ft. At Cleveland Airport, four of eight runways are being lengthened to 7,000 ft. At Denver, Colo., an 8,530-ft strip is to be lengthened to 10,000 ft next year, and Indianapolis' Weir Cook Airport has a 10-year program to extend all four runways to 7,200 ft and to build two new 7,200-ft parallel strips.

Kansas City (Mo.) Municipal Airport won't lengthen existing strips but plans a new one 7,000 ft long, to be completed next year. Los Angeles Municipal Airport plans to extend its two longest strips to 7,500 and 8,500 ft, to be completed in 1952. The four Miami International Airport extensions, 2,400 ft each, are to go under construction shortly and be ready for use in 1952.

Port of New York Authority, which operates LaGuardia, International, Newark and Teterboro (N. J.) airports, has a four-runway master plan for Newark. It calls for strips of 7,000 ft and 6,250 ft to be complete in two or three years, others to follow as traffic warrants. There are three strips in operation there now, two of them over 6,000 ft long. At Philadelphia Airport, plans call for the extension of a 5,400-ft instrument runway to 7,400 ft this year. At Lambert-St. Louis Municipal Airport, plans call for the lengthening of a 5,100-ft strip to 7,200 ft next year and the construction of a 6,500-ft runway which will replace an existing 4,756-ft strip. Ultimately, the 7,200-ft runway may be extended to 9,000 ft, but these plans aren't firm.

Airports at which no extensions are being planned include Chicago's Midway, New York's LaGuardia, International and Teterboro and Washington's National.

CONSTRUCTION BUSINESS



Construction business booming in every part of the U.S.

Every month this year has been a construction record breaker, and last month was biggest of all. May contract awards hit the new peacetime high of $931,153,000. This is an average of $233 million per week for engineering construction.

The record activity holds for every region of the U.S. (See p 24)

In New England, public and private housing have pushed total awards 87% above last year. In the Middle Atlantic States, industrial building, private and public housing, highways, and bridges contribute most to put overall volume 40% over 1949. In the South, public roads and private housing are strongest factors in a 58% increase over 1949.

Middle West private housing and public buildings lead May contracts, bringing this year's total 50% over last year. West of the Mississippi, highways, pipelines, and private housing put the area 24% above last year. In the Far West, federal building, earthworks, and waterways contracts are high, along with private housing, for a 75% gain over last year.

Across the nation, private housing is the biggest force in construction this year. Large-scale housing contracts are 105% above last year. But all other private construction is up sharply, too. And so are public highways, waterworks, and the atomic energy program.

Price of steel shapes up 20 cents a cwt

Warehouses in the Middle West have started a 20-cent per cwt increase in prices of heavy steel items, especially shapes and plates. It isn't general across the country yet, but it has hit most big cities.

Chicago and Detroit warehouses started the increase in early May. It spread to Cincinnati May 15 and to Cleveland 2 days later. Baltimore was among the first eastern cities to get it. Following, a large New York City warehouse put the same 20-cent rise into effect, and others are following. Los Angeles warehouses expect to make the change there soon.

Southern California trades get 8¢ raise

The six basic construction trades unions in Southern California will get an 8-cent hourly wage increase effective July 10, if the unions ratify.

But the carpenters say they won't ratify the tentative agreement. They ask a 15-cent raise to $2.25, 5 cents ahead of the operating engineers and 3 cents under cement finishers.

ENGINEERING CONSTRUCTION CONTRACTS REPORTED TO ENGINEERING NEWS-RECORD—MAY, 1950

	May, 1950						U. S. Cumulative Five Months		% change	Canada May,
	New England	Middle Atlantic	South	Mid-West	West of Mississippi	Far West	Total U. S.	1950	1949	'49-'50	1950
Public Works											
Waterworks											
Sewerage											
Bridges											
Earthwork and retaining											
Streets and roads											
Public buildings (residential)											
Other public buildings											
Unclassified											
Total public											
Federal (incl. corp. and authority)											
State (municipal)											
Private											
Bridges											
Earthwork and retaining											
Residential buildings (residential)											
Other residential buildings											
Unclassified											
Total private											
Total Engineering Construction											
May 1950 4 weeks											
April 1950 4 weeks											
May 1949 4 weeks											
Five Months 1950											
Five Months 1949											
% change '49-'50											

BIDS AND BIDDERS

(Major project news received after Construction Reports, page 77, went to press.)

Motor Assembly Plant—Bids were opened June 5, at office of Albert Kahn Associated Architects & Engineers, Detroit, Mich. on general contract for foundry and boiler house for motor assembly plant at Cleveland, O., for Ford Motor Co., Detroit, Mich. Estimated cost of this section is $10,000,000. Substructures for buildings are underway and steel is ordered. Total cost of entire project will be $80,000,000. E. A. Fairbrother & Co. and George Miellis, Detroit, are architects. Results not yet available.

College Buildings—Case Institute of Technology, Cleveland, O. plans constructing gymnasium, swimming pool, laboratory, library, administration and other buildings to cost about $10,000,000. J. Gray Erzer, Cleveland, is architect for owner.

Residences—Robai Construction Co., Phila., Pa. will construct residences in Ellisburg, N. J. for Meadowbrook Homes, Inc., Phila. Pa. at about $12,000,000. Edward A. L. Cox, Camden, N. J. is architect.

Hydroelectric Project—Republic of El Salvador, San Salvador, will open bids June 30 for hydroelectric project on Lempa River to cost about $16,000,000. American contractors are asked to bid on job and bid date may be extended. Hanza Engineering Co., Chicago, Ill. is engineer.

Steel Mill—Republic Steel Corp., Cleveland, O. plans constructing $7,000,000 addition to cold rolled sheet mill in Cleveland.

Schools—Fairfax County, Fairfax, Va. voted $10,500,000 bonds for constructing new schools and altering present structures.

Apartment and Shopping Project—Don M. Castro, Don M. Castro, Jr. and Morris Skilken, Columbus, O. will construct apartment and shopping center, in Dayton, O. to cost about $8,000,000. Work will be done by owners' forces.

Underground Parking Garage—Bid opening has been extended to June 22 at the request of prospective bidders for the construction and operation for fifty years of garage under Pershing Square in downtown Los Angeles. Recreation & Parks Commission, Los Angeles called for similar bids January 27 but none were received. Estimated cost of project is about $5,000,000.

Apartment—Ring Construction Co., Washington, D. C. will build apartments in Washington, D. C. for International Brotherhood of Electrical Workers, Washington, D. C. at about $4,500,000. Wallace Dixon, Washington, is architect.

Homes—Commonwealth Homes Corp., Tampa, will construct $4,000,000 homes in Tampa, with own forces. Joseph Veccani, Tampa, is architect.

Warehouse Addition—Firestone Tire & Rubber Co., Akron, O. plans branch warehouse addition in Des Moines, Ia. Estimated cost is $5,000,000.

Dormitories—Gilbane Building Co., Providence, R. I. was low at $4,097,432 when Brown University, Providence, opened bids May 18 for dormitories. Perry, Shaw, Hepburn, Kehoe & Dean, Boston are architects; Cleverdon, Varney & Pike, Boston, are engineers.

Water Supply—Colorado River Municipal Water Assn., Big Spring, Tex., plans water supply, including dam, for towns of Midland, Big Spring and Odessa, Tex. Estimated cost will be $6,500,000. Freeze & Nichols, Fort Worth, are engineers.

Roads—Hankin-Conley Construction Co., Cleveland, O. was low at $3,030,576 for Section 31B, road in Allegheny County, when the Pennsylvania Turnpike Commission, Harrisburg, took bids May 31. D. W. Winkleman Co., Syracuse, N. Y. was low at $4,087,989 for Section 29B and 29C, Beaver County at same opening.

Hospital—St. John's Hospital, Springfield, Mo. received low bid for constructing nurses home and boiler house in Springfield from McGaugh Brothers, Construction Co., St. Paul, Minn. at $4,092,000. Magnolo & Quick, St. Louis, are architects.

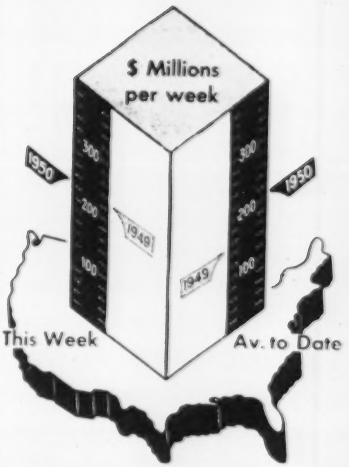
Apartment—MacDonald Construction Co., St. Louis, Mo. has been awarded contract for $3,500,000 apartment in St. Louis, by Essex House Warner Kanter Co., Birmingham, Ala. Pebbleton & Mims, Birmingham, Ala. and C. G. Wenzel, St. Louis are architects.

Hotel, Apartment and Shopping Center—H. Leslie Hill, Dallas, Tex. plans constructing hotel, apartment and shopping center in Dallas to cost $3,500,000. Walter W. Ahlschlager, Dallas, is architect. C. M. Smith and J. H. Morgan, are engineers.

COSTS AND VOLUME

ENR INDEX NUMBERS

Index Base = 100		1913	1926
Construction Cost	June '50	506.45	243.45
Building Cost	June '50	372.96	201.61
Volume	May '50	404	206



Activity This Week

As reported to ENR (in millions of dollars)

Amount of contracts let

	Week of June 8 1950	Cumulative 1950 vs. 1949	Cumulative 1949	% change
Federal	$26.6	$647.1	$468.5	+38
State & Mun.	71.8	1,482.4	1,284.8	+14
Total Public	$98.4	$2,129.5	$1,753.3	+21
Total Private	128.4	2,745.8	1,639.8	+67
U. S. Total	$226.8	$4,875.3	$3,393.1	+44

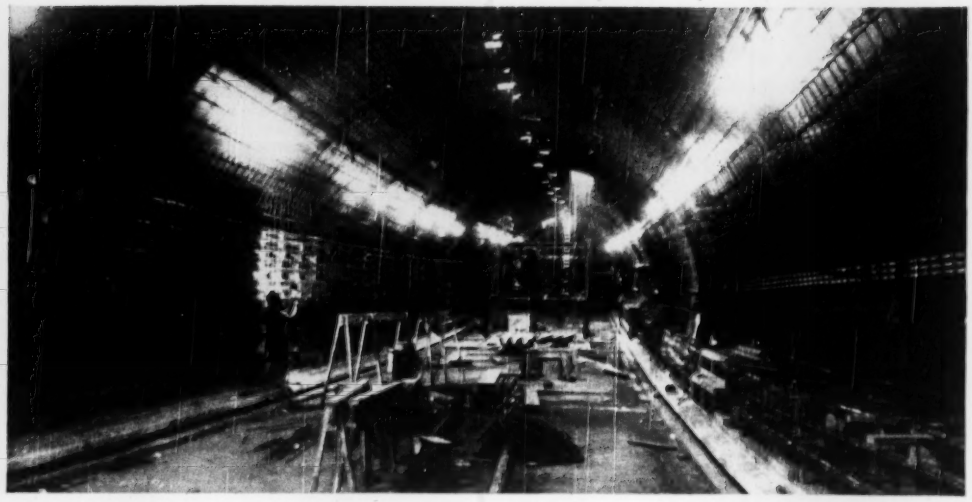
Contracts by type of work

	This Week	Cumulative 1950 vs. 1949 1950	Cumulative 1949	% change
Waterworks	17.0	$196.3	$74.0	+165
Sewerage	5.8	104.3	59.7	+75
Bridges	10.4	164.1	122.6	+34
Highways	13.7	319.8	148.1	+116
Earthwork, Waterways	19.2	206.3	221.1	−7
Buildings, Public	22.8	378.8	65.6	+477
Industrial	17.1	331.6	326.1	+2
Commercial	16.3	1,392.7	1,150.6	+21
Unclassified	10.4	281.4	204.5	+38

NOTE: Minimum size projects included are: Waterworks and waterways projects, $25,000; other public works, $50,000; industrial buildings, $50,000; private buildings, $250,000.

New capital for construction

	Cumulative 1950	Cumulative 1949	% change
Corporate Securities	$881.3	$1,116.6	−22
State and Municipal			
Excl. Housing	922.6	885.8	+4
Housing	598.0	742.9	−19
Total Capital	$2,116.3	$2,743.3	−23



CONCRETE AND TILE are the final step in completing this section of the new Washburn Tunnel, near Houston, Texas.

Houston Tunnel Opens for Business

OPENED FOR BUSINESS late in May, the $7,000,000 Washburn Tunnel under the Houston ship channel is ready to channel heavy local and through traffic around the congested center of Houston, Texas.

The last bulkhead in the 2,950-ft tube was removed in the subaqueous section on Feb. 17, and work on access roads and finishing was rushed to meet a May opening date.

This tunnel (originally known as the Pasadena tunnel) is the center of a total of 7.4 miles of access roads now being built at a cost of $2,000,000 both on the north and south sides of the ship channel that connects Houston with the Gulf. Included are three four-lane highways, three bridges, two traffic circles and two railroad underpasses.

The access roads will relieve traffic congestion in the suburbs of Pasadena and Galena Park, and together with the tunnel itself will give Houston in effect its first circumferential highway, eliminating the necessity for South Texas traffic traveling through the congested business center of the city.

Tunnel Details—The tunnel has a total length of 3,791 ft between grade points, made up of 855 ft of open ramps, 1,436 ft concrete arch-built in the dry, in inclined open trenches at each end, and 1,500 ft of steel and concrete tube sunk in a trench excavated across the bed of the ship channel.

The tube is circular in shape, with an inside diameter of 32 ft, to accommodate two lines of traffic, police walkways, air ducts and power and telephone circuits.

Maximum grade on the approaches is 6 percent. The top of the tunnel is 80 ft below mean low water in the ship channel, which has a navigable depth of 45 ft.

Steel for the four sections of the tube under the channel was fabricated in the plant of the Ingalls Shipbuilding Co. at Pascagoula, Miss., and each tube was assembled on the shipways there. After bulkheading and launching the tube sections were ballasted for stability and floated 500 miles through the Gulf of Mexico and the ship channel to the Clinton Dock at Galena, Texas, about 2 miles from the tunnel site. There the main circumferential reinforcing for the 24-in concrete strengthening ring was completed, the steel being wired to longitudinal rods which had been attached to the inner shell by flash-welded studs. Concrete for the roadway, walks, ducts and conduits also were installed there, as was as much of the outside concrete as possible without exceeding the draft permitted in towing the sections to the site.

Sections Sunk in Place—Upon arrival at the tunnel site, each section was sunk accurately by adding enough tremie concrete to produce a negative buoyancy of about 20 tons. The sections were controlled and supported during sinking by two floating cranes, and were landed on two steel pile bents previously driven in the bottom of the trench. Eighty tons of concrete were then loaded into the sections and they were aligned and secured to the adjacent tube by positioning pins and steamboat ratchets.

The joints consisted of circular knife edges on one tube, drawn into the gasketed circular groove on the other to form a watertight seal. A heavy blanket of tremie concrete was poured outside these joint sections and sand fill jetted around and under the tube, after which temporary supports were cut. Concreting of the outer shell was completed with tremie-placed concrete.

With the sinking and aligning operations completed, the temporary watertight bulkheads at either end of each section were removed, the joints made permanently watertight by a channel ring welded across the gasketed joint, and the interior tiling, paving, lighting and other accessories installed.

Shore Sections—The shore sections, as previously noted were built in open cut. When the cuts had been graded to the required shape, a 4-in. blanket was laid down on the subgrade for the width of the tunnel section, with keyways at intervals to resist the tendency of the tunnel arch to slide downhill. Membrane waterproofing, consisting

of fabric and tar 8 plies thick, was installed on this sand bed to act as a base for a segment of arch and invert that was poured and cured.

A traveler for the inner forms then was erected on rails placed on the invert, reinforcing was installed, the outer form traveler was positioned and the main arch was concreted in a single pour. Roadway haunches and slab, curbs, sidewalk and the conduit casings were poured in subsequent pours.

When the arch concrete was properly cured, a further waterproofing membrane was applied over the entire arch, protected with fiberboard insulation. The trench was then backfilled with permeable material used close to the arch and spoil from the excavation for the remainder of the backfill.

Operating Features—Practically automatic in its operation, the tunnel has a ventilation system including three blower fans in a ventilation building to pump fresh air into the air duct under the roadway. Each fan has a top capacity of 542,000 cfm and two of the units can supply air required, the third being used as a standby. There is no upper exhaust duct as in many vehicle tunnels. Exhaust air moves to the entrances in the upper part of the tube.

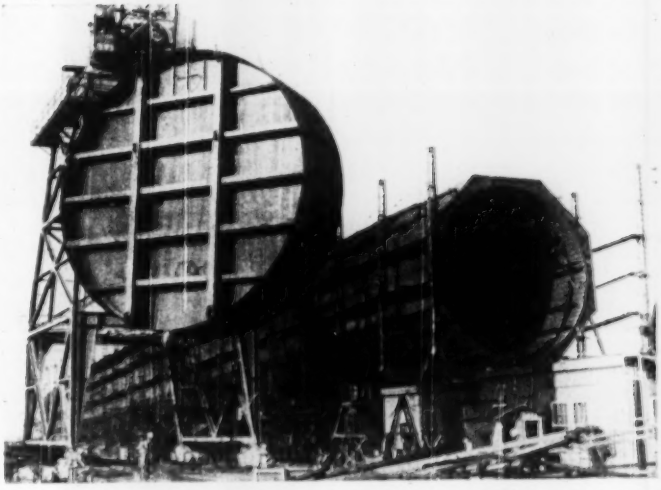
Two devices one maintaining a continuous count of the number of vehicles and the other a continual analysis of the air—activate electronic controls determining the speed of the fans. In this way it is planned to keep the concentration of carbon monoxide below 4 parts per 10,000.

A pumping system is installed to clear the tunnel of any rainfall that comes in from the open ramps, and at mid-channel there is a pumping station to handle any accumulation of water from seepage or washing operations.

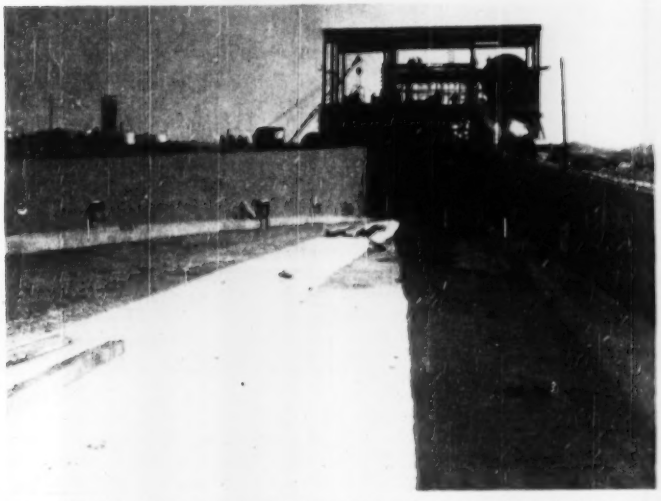
Illumination is provided by a continuous fluorescent lighting fixture at the crown of the arch. This is supplemented by other fixtures providing higher intensity near the portals.

The tunnel and access road system was financed through bond issues approved by the voters of Harris County of which Houston is the seat. Principal contractor was Merritt-Chapman & Scott Corp. of New York for construction of the tunnel and ramps.

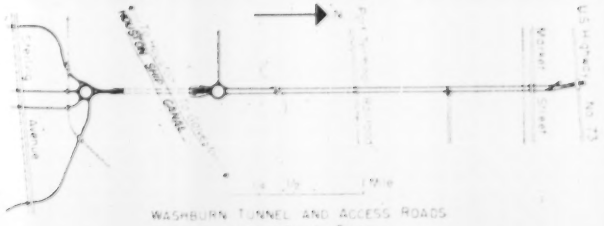
Palmer and Baker, Inc., consulting engineers of Mobile, Ala., prepared plans and specifications and acted as administrator and supervisor of the construction contracts, both on the tunnel and access roads. Robert R. Baker, vice president, was in charge of construction and contract administration, with Rear Admiral William H. Smith (CEC) USN (retired) as chief engineer.



BULKHEAD, handled lightly by gantry crane, is ready to go in place to seal section of tube, ready for floating to tunnel site.



ENTRANCE to tunnel (from north side) will be under the ventilation building going up at center of photo.



WASHBURN TUNNEL AND ACCESS ROADS
Harris County, Texas

LOCATION of the new facility is the center of a network of access roads now under construction. Roads will provide by-pass of downtown Houston.

Controlled performance tests provide an engineering basis of comparison for . . .

Conventional and Upflow Settling Basins

H. S. Morgan
Consoer, Townsend & Associates
Consulting Engineers
Chicago, Ill.

D. R. Miller
Sanitary Engineer
Great Lakes Naval Training Center
Great Lakes, Ill.

WILL a sludge-blanket type of upflow coagulation basin function successfully on water of low turbidity? Engineers faced with selection of coagulation equipment for use on large bodies of quiescent water find this question arising most often in developing supplies from the Great Lakes and from some rivers with extremely low turbidities. Typical are power-making districts of the U. S. and Canada.

An installation at the Naval Training Center, Great Lakes, Ill., afforded an excellent opportunity to find a partial answer—when using Lake Michigan water. A 2.5 mgd conventional sedimentation (downflow) and a 3 mdg upflow basin—side by side—made possible fair comparison of the two types of coagulation facilities.

• **Findings**—Carefully controlled and evaluated performance tests lead to these conclusions:

1. The upflow basin tested will function with use of activated silica on lake water of turbidity of 10 ppm or less, and low alkalinity.

2. Operation of upflow basins is more complex, requiring more control and operator attention than conventional tanks.

3. Combined annual expense of amortizing and operating plants with upflow units is less than that of facilities with conventional downflow tanks having mechanical sludge removal. This holds for waters with low turbidity and prevailing construction costs. It is particularly true when land costs are high or site of adequate size is lacking.

4. Anthracite media with 0.70 to 0.85 mm effective size materially increased filter runs of upflow unit effluent treated with activated silica coagulant aid. But this media also lengthened filter runs with downflow tank effluent dosed only with aluminum sulfate coagulant.

5. Upflow units are sensitive to raw water temperature increases when the rate of change is equal to or greater than 1 deg per hr.

• **Plant characteristics**—Raw water is taken from Lake Michigan at a 42 ft depth through an 8,000 ft intake pipe. Total water delivered was measured by a Venturi meter, inflow to the upflow unit by a propeller-type meter.

Arrangement of the dual-facility plant is given in the flow diagram. The settled-water flume has a gate dividing the east from the west group of filters. This made possible delivery of effluent from the conventional basin to filters 1 and 2 and that from the upflow unit to filters 5 and 6.

Overflow rate from the conventional sedimentation basin was about 0.4 gpm per sq ft. The upflow unit was designed with a nominal capacity of 3 mgd at a rise velocity of 2.25 gpm per sq ft of clear-water area.

Effective size of filter sand when installed was 0.45-0.55 millimeter. From 4.6 in. of sand had been washed off the filters since the plant was built. An analysis indicated average effective size of remaining sand of all filters to be about 0.60 mm.

Pumping economy is effected in winter by passing raw water through power-house steam-turbine condensers enroute to the treatment plant. As power load increases in the morning, condenser-water temperature rises. Temperature of water received at the treatment plant then increases 2-10 deg.

This change, occurring in a short period, causes severe temperature "shocks" in the upflow unit. Considerable floc passes over effluent weirs, materially shortening filter runs.

Condensers, on the other hand, are by-passed during warm weather so that cold water goes directly to the plant. Water temperature in the summer reaches 70 deg.

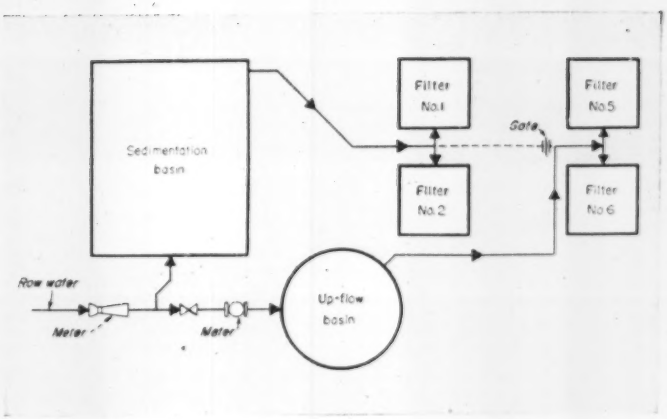
To eliminate the abnormal effect of increasing water temperature, tests of the two settling basins were made in the summer. Pre-test trials in the winter showed that no conclusions could be drawn from comparative performance.

• **Pay-off tests**—Before final testing, the upflow unit was revamped to include latest design modifications. A number of settling plates and draft-tube baffles (photo)—furnished without charge by the manufacturer—were installed. Weirs were released and points of chemical application were changed at the same time.

Tests were then continued for about a month, taking water directly from

TABLE I—COMPARISON OF FILTER RUNS WITH EFFLUENT FROM CONVENTIONAL AND FROM UPFLOW—SETTLING BASINS

	Raw Water			Up-Flow Basin				Sedimentation Basin		
	Temperature deg F			Aver. Rate	Grains ppm			Aver. Rate	Grains	
Date	High	Low	Turbidity ppm	Thru Put Mgd	Per Gal Alum	Activated Silica	Effluent Turbicity	Thru-Put Mgd	Per Gal Alum	Effluent Turbidity
Sept. 13	57.5	55.5	8	2.88	0.60	3	2	2.52	0.68	4
Sept. 14	58.0	57.5	7	2.88	0.67	2.5	2	2.74	0.69	5
Sept. 15	58.0	57.5	5	2.88	0.60	2.0	1	2.84	0.72	4
Sept. 16	54.5	54.0	6	2.88	0.58	2.0	2	2.72	0.75	4
Sept. 17	54.0	52.5	5	2.88	0.65	2.0	1	2.74	0.58	4
Sept. 18	49.0	45.5	5	2.88	0.74	3.0	2	2.47	0.71	4
Sept. 19	48.5	46.0	5	2.45	0.69	2.0	2	2.33	0.66	4
Sept. 20	54.0	46.5	5	2.88	0.70	2.0	2	2.93	0.78	3
Average	53.8		5	2.80	0.67	2.3	2	2.66	0.69	4



COMPARABLE PERFORMANCE TESTS of a conventional sedimentation tank and an upflow-settling basin were made with side-by-side units. A pair of rapid sand filters served each unit.

STEEL-PLATE BAFFLES were installed in the inner draft tube of upflow settling tank to reduce cross currents.

Lake Michigan. It took several days at the start to build up a slurry pool in the upflow unit and make adjustments for best operating performance.

Raw-water chemical dosage to the upflow unit during testing was: Aluminum sulfate into the influent pipe about 3 sec ahead of activated silica; and activated silica about 1 sec ahead of the draft tube. Alum dosage was about 0.67 grains per gal; activated silica varied from 3-5 ppm. Activated silica was prepared by batching and aging 1 hr before use.

Only alum was added for coagulation to the conventional basin. Dosage was about 0.7 gpg.

Activated carbon was added to both upflow and downflow influent for taste control. Rate was about 45 lb per mg. Raw water was also chlorinated at intake pumps.

• **Test observations**—When controlled runs were started, raw water turbidity averaged 6 ppm. The upflow unit appeared to be working well. Floc was breaking cleanly in sharp patterns. The slurry pool was well defined. Effluent turbidity averaged 2.5 ppm.

Effluent from the upflow unit was crystalline but a small amount of floc escaped continuously over the weirs. Effluent from the conventional basin was slightly cloudy on the filters due to pin point floc.

In spite of better appearance and turbidity, upflow basin outflow did not give filter runs as long as that from conventional basins. It is believed that activated silica produced a floc so tough in water at summer temperatures that—although carry-over was very small—filter runs were materially reduced. The activated silica, it should be noted, appeared necessary for slurry formation with low raw-water turbidity.

Some floc carry-over may have also been caused by agitation of water in the upflow unit that released air to coalesce on floc particles, thus reducing their specific gravity. Determination of dissolved air in raw water indicated supersaturation.

Another factor checked was a lower rate of displacement. When throughput was reduced from 2.25 to 2.0 mgd, there was no apparent effect either on filter-run length or quality of upflow unit effluent.

Algae in raw water materially shortened filter runs with effluent from both settling basins. When wind caused a shift in lake currents, algae were washed away from the intake. Sedimentation-basin-fed filter runs increased from 12.5 to 31 hr while those with upflow-unit effluent rose from 8.4 to 10.9 hr.

These currents also increased raw-water turbidity and temperature. The 1 to 5 deg rise produced some slurry upset and "boils" in upflow units.

Total alkalinity of Lake Michigan water is very low—about 115 ppm. So lime was added in an attempt to get a floc. Lime was fed at the rate of 0.62 gpg. Readings of pH were:

	pH readings		
	Raw Water	Upflow Basin Effluent	Filtered Water
Without Lime	8.2	7.6	7.6
With Lime	8.3	8.5	8.0

Filter-run results with lime-dosed water were inconclusive.

Activated silica dosage to the upflow unit was reduced gradually. The basin continued to function at a dosage of 2 ppm. However, the slurry pool quickly lost definition and floc began to leave the basin in considerable quantity when activated silica was entirely cut off.

• **Anthracite filtering media**—As a final expedient, anthracite filtering sand about 9 in. deep was placed over filter 6. Its effective size was 0.70-0.85 mm.

Tests were then run for 7 days. Data taken during these runs com-

TABLE II—FILTER OPERATING DATA WITH INFLUENT FROM CONVENTIONAL AND UPFLOW SETTLING BASINS

	Sedimentation Basin Supply		Upflow-Basin Supply	
	Filter No. 1	Filter No. 2	Filter No. 5	Filter* No. 6
Average Run (hr)	46.0	33.1	17.8	22.6
Average Total Head Loss (ft)	9.45	8.92	8.56	8.75
Total Water Filtered (mg)	6.95	8.40	6.16	7.19
Total Wash Water (gal)	145,000	235,000	247,000	228,000
Wash Water ( )	2.31	2.80	4.01	3.18

* Anthracite filter sand on this filter.

pare filter runs with effluent from the two types of coagulating units. Both were operating under fairly good conditions (Table I).

Filter 6—with a surface layer of anthracite media—might be taken as an indication of upflow-basin efficiency. Then this plant—operating solely from the upflow basin—would be likely to require 25% more wash water per unit of capacity than when operating from conventional sedimentation basins serving silica-sand filters.

Subsequent to these tests, upflow basin were placed in series as rapid mix basins ahead of sedimentation units. By continuing operation with the anthracite-surfaced filter, filter runs were increased—about 11%. This is about the same increase as when the upflow-basin pretreatment was used.

Past operating records of all filters were checked to determine any consistent differences in filter runs that might affect test accuracy. Records inspected indicated no major difference.

Filter-rate controllers and loss of head gages were checked and filter-drop tests made. Data given in tables are modified by all correction factors. The tests were intended to be practical rather than scientific. All factors were not controllable, but tests were run in conjunction with normal plant operation.

• **Cost analysis**—Construction cost of upflow basins is substantially less than that for equal-capacity standard sedimentation basins with mechanical sludge removal. An analysis indicates that for this type of water, upflow basins requiring more chemicals and using more wash water will cost substantially less on an annual basis than standard downflow basins of comparable capacity.

Operating data (Table II) shows the performance comparison between the upflow unit serving filters 5 and 6, and the sedimentation basin serving filters 1 and 2.

• **Credits**—During the tests, all operation of the upflow basins was conducted by Infilco, Inc., personnel under the direction of A. A. Kalinski, chief development engineer. The sedimentation basins and filters were operated by the Naval Training Center waterworks personnel under the direction of D. R. Miller, sanitary engineer. Consoer, Townsend & Associates, who designed the improvements, were represented by an engineer-observer at intervals during testing.

The upflow units were manufactured by Infilco Inc., Chicago, Ill.

Invert Bridge Spots Concrete Trucks

WHEN WALSH-PERINI got to the invert-paving phase of their Downsville Dam diversion tunnel job, they assembled an efficient concreting bridge-traveler out of materials that already had been used on the job.

These materials included structural members and four two-wheel trucks from the huge jumbo that had been used for driving the 40-ft dia tunnel. (Said to be the biggest in the world, the jumbo was described in ENR Jan. 20, 1949, p 78).

On the rolling bridge the contractors mounted a hoisting engine and truss-platform and guide timbers. They also put simple screw-and-wedge brakes on two of the bridge's trucks (one brake on each side).

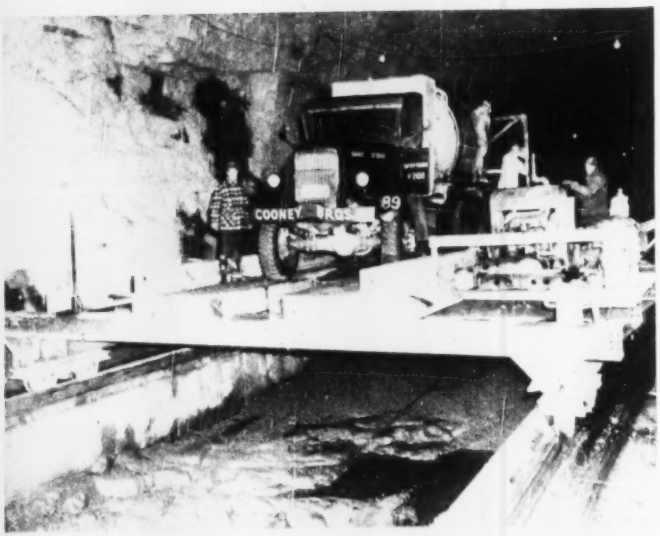
To set the job up, contractors first poured tunnel curb walls, on which they laid rails that would carry the bridge. Then they built a movable timber truck ramp on existing invert-elevation concrete at the tunnel's outlet.

Concreting proceeded in 100-ft sections from the outlet (lowest elevation), the concrete being poured backward within each section, from transverse header to the previously placed section.

In operation, a loaded 4-yd concrete truck backed up the ramp onto the bridge. The hoist operator put the power on his line (two-part tackle dead-ended to a snatch block on a tunnel rib up ahead) and hauled bridge and truck upgrade to the forms, where the truck dumped its load. To return, the operator slacked off his line, allowing the bridge to roll back to the ramp. Brakemen, using hand-spikes on the brake-screw wheels, eased the rig to a stop.

After three to five 100-ft sections had been concreted, crews moved the timber ramp forward on the new invert. Invert between portal and ramp was filled temporarily with enough coked gravel to facilitate concrete-truck operation over the invert's circular section.

Walsh Construction Co. (New York) and B. Perini & Sons, Inc. (Framingham, Mass.) built the diversion tunnel for the New York Board of Water Supply, in connection with their contract for the first stage of Downsville Dam. J. S. Macdonald was the contractor's project manager and A. J. Allie was project engineer. The contractor's office is in Roscoe, N. Y.



SELF-POWERED RIG for setting concrete trucks over Downsville Dam diversion tunnel invert forms was made from parts of huge jumbo that drove the tunnel. (John Clark photo)

PILE-SUPPORTED WALL retains new highway fill in Houston, Tex. Wall is tied to deadmen under roadway for stability. Beam at bottom caps piles; beam at top carries railing.

TIES TO DEADMEN are 2¼-in. dia and 70 ft long. Stone piles and sticks kept them level while sand backfill was placed. Crib drains on wall face were gravel filled.

Hog-Tying a Retaining Wall

Elton Sterrett
Houston, Texas

IN WIDENING RIGHT-OF-WAY for the new three-lane highway replacing old Buffalo Drive in Houston, Tex., a concrete retaining wall had to be built on a curve across the heel of a bayou—a bottom of quicksand and long buried log jams.

The usual wide footing for wall stability could not be supported on this bog. So the structure was put on precast concrete piles and "hog tied" to deadmen under the new roadway.

Piles were driven in pairs along the length of the wall, then capped with a reinforced concrete beam. This beam not only encases the piles but also holds the steel ties that were anchored under the backfill to keep the wall safe from shifting or overturning. Reinforcing rods tie the wall to this beam, and a second, lighter beam, topping the wall, carries the guard rail posts.

At 10-ft intervals through the main tie beam, 4-in. holes were cast, horizontal and radial to the slight curve on which the wall was constructed. In line with the wall, and 70 ft back from it, a trench was cut to the depth of the holes, and lateral cuts were made from the holes in the wall to this parallel trench.

In the face of the wall, and extending back to the lateral trench, 70-ft long tie rods of 2¼-in. dia steel were placed, with a heavy square washer or plate on the outer face of the beam and a nut to allow tension adjustment. Inner ends of the rods were anchored in deadmen in the lateral trench, which was then backfilled and allowed to settle before all fill was placed behind the wall.

The "hog tie" rods, as they were termed on the job, were doped with hot enamel, and then wrapped with a coating of glass fiber strips to protect the coating against soil stress as the fill settled. The rods were leveled across the open space by wooden cross-braces on heaps of stone, so that they would not sag under the fill before it could be compacted. Specifications called for an all-sand fill up to a level higher than the tie rods, to protect them against possible damage by heavier material to be dumped later. Holes through the tie beam were left open, it was felt that the sand would fill the aperture around the rod and still provide what drainage was necessary.

To remove water from behind the wall, small timber cribs were carried up the inside face between each pair of tie rods. These cribs were filled with gravel up to 1-in. size. At the base of each crib was a drain through the wall with a check valve on the outside to prevent entry of water in the event the bayou flooded above the height of outlets.

With the light timber cribs to hold the gravel in place until the fill had consolidated, it was felt that ultimate decay of the crib's wooden slats would not disturb the gravel sufficiently to affect the drainage channels thus provided.

Work on the enlarged Buffalo Drive is under direction of J. M. Nagle, director of public works for the city of Houston. J. G. McKenzie, bridge engineer in the department of Public Works was responsible for design of the wall. Contractor on the job was Bishop Construction Co., of Houston.

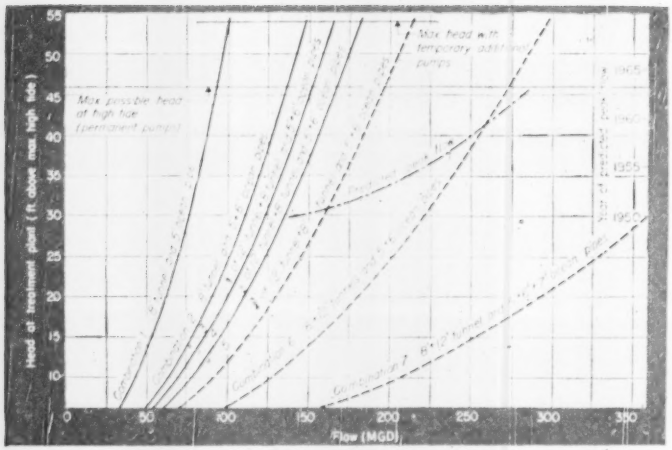

Head at treatment plant (ft. above max. high tide)
Flow (MGD)
Max possible head at high tide (permanent pumps)
Max head with temporary additional pumps
1965
1955
1950

FIG. 1. HYDRAULIC CAPACITY of the outfall system was kept even with load by step-by-step development. Combination 4 will be finished this year. Additional construction will be necessary if predicted flow increases materialize.

Step-by-Step Tunnel Construction Keeps Sewer Capacity Ahead of Flow

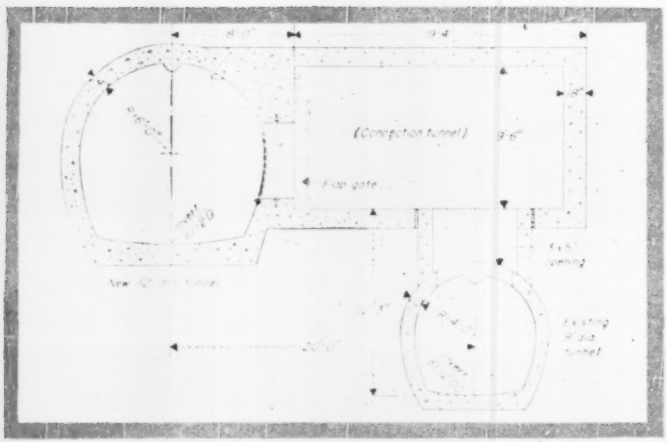


FIG. 3. BY CONNECTING the first section of 12-ft dia tunnel into the old 8-ft dia tunnel hydraulic capacity of the outfall system was materially increased. This minimized investment and provided additional capacity in a short time.

GRADUAL DEVELOPMENT of the system of pumps, tunnels, and ocean outfalls serving the Los Angeles County Sanitation Districts has kept the hydraulic capacity ahead of the rapidly increasing flow and minimized capital investment.

The system conveys effluent from the districts' sewage treatment plant to the Pacific Ocean. Three years ago it included 6 miles of 8-ft dia tunnel and 1 mile of 5-ft dia under-water ocean pipeline, capable of carrying 95 mgd when pumping against maximum tide (combination 1 on Fig. 1).

Increased flow in the various districts due to wartime and postwar growth together with addition of new districts that included sizable cities (Pasadena and Long Beach) necessitated additional outfall capacity.

First postwar addition to the outfall facilities involved the construction of a 6-ft dia, mile-long ocean outfall (ENR Mar. 4, 1948, vol. p. 368). This was completed early in 1948 and increased the capacity to 137 mgd at maximum tide (combination 2 on Fig. 1).

Next step in development of the outfall facilities was to be the addition of a 6-mile long, 12-ft dia horseshoe tunnel, roughly paralleling the existing 8-ft tunnel (see Fig. 2). However, there were two considerations working against the immediate construction of the entire tunnel. First of all, the entire capacity was not immediately needed and was not expected to be required for some time. (The new tunnel would double capacity of the system.)

Significant capacity could be added by building the tunnel in two or more steps and connecting the completed portions to the existing tunnel. This would minimize the immediate investment required and result in a significant saving in interest charges. Under a step-by-step development, much of the cost could be met by current tax revenues and thus less bond money would be required.

However, need for some additional capacity was apparent. Thus, the second consideration working against construction of the entire tunnel was time. It would have taken too long for the entire tunnel job—flow would have exceeded capacity before the tunnel could be completed in its entirety.

Another alternative was construction of a reservoir near the treatment plant to store peak flow of treated sewage. A 10-acre site was available and this could be developed to a depth of 10 ft. This expedient was discarded because it could provide only temporary relief. However, this plant is being kept as an ace in the hole should the flow increase more rapidly than predicted; the holding reservoir can

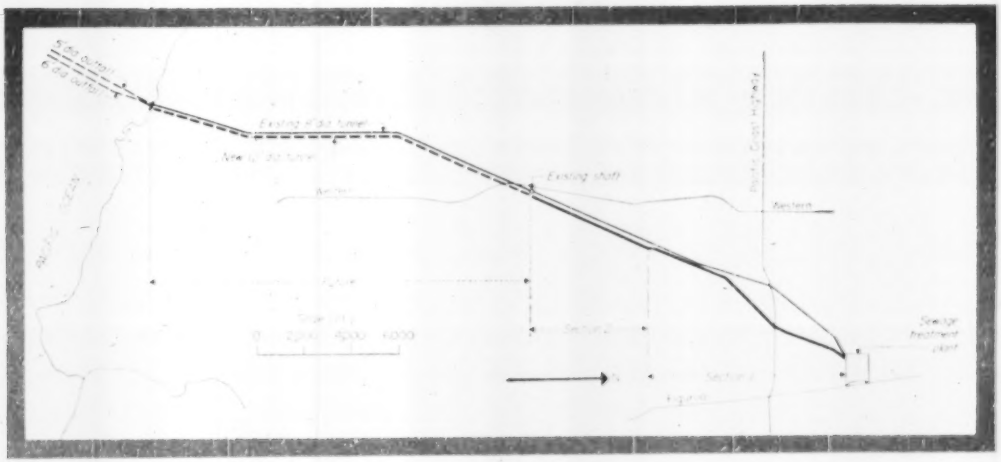


FIG. 2. TUNNELS pierce a 1,500-ft high range of mountains lying between the treatment plant and the Pacific Ocean. Favorable currents disperse effluent, making secondary treatment unnecessary.

be constructed in a short time.

• Two miles built first—The first step was the construction of a 2-mile section on the inshore end of the tunnel (section 1 on Fig. 2). This was completed in July, 1949, and a connection made between the new tunnel and the existing 8-ft tunnel as will be described in the following. Maximum capacity was increased to 152 mgd at high tide (combination 3 on Fig. 1).

Actually, only 5,630 ft of this new outfall section was tunneled (12-ft dia driven through dry sand). The rest of it (6,044 ft) was 12-ft dia precast concrete pipe laid in open cut. Trench depth varied up to 40 ft.

As soon as this work was completed, construction began on an additional mile of 12-ft dia tunnel. A 160-ft deep shaft built for the construction of the first tunnel was rehabilitated and used for the new work. The shaft is located about midway between the treatment plant and the ocean. This second step will be completed this year (1950) and will increase capacity to 168 mgd (combination 4 on Fig. 1).

Another expedient now under construction is the installation of additional pumping capacity at the upper end of the tunnel. This will raise the plant effluent another 8 ft, thereby increasing combination 4's capacity from 168 to 182 mgd. This measure is temporary and will no longer be necessary when combination 6 is furnished.

Next step in development will be either completion of the entire tunnel (combination 6) or completion of another 14 miles of its length (combination 5). No date has been set for this work. However, it is expected to be within the next 5 years. Then capacity would be available for anticipated growth in the system for 10 or 15 years more. The last step in the development will be an additional ocean outfall, this unit to be 7 ft dia (combination 7).

• Tunnel through running sand—

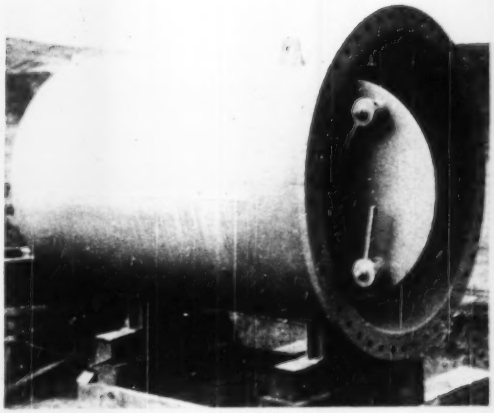


FIG. 4. WHEN MAKING the connection between old and new tunnels this 5-ft dia airlock helped maintain pressure in the crosscut between tunnels.

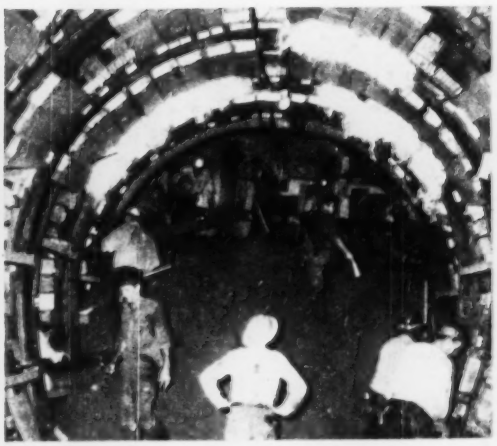


FIG. 5. TO KEEP RUNNING SAND OUT of the tunnel, workmen bulkheaded the tunnel face and jammed excelsior in cracks between soldiers (wedge-shaped timbers driven over ribs).

Much of the tunnel was driven through running sand. This necessitated the use of steel ribs of 20-lb, 6-in. H-sections spaced 4½ ft apart. Timber spiling, 2 in. thick, was driven completely around these steel ribs by pneumatic hammers. To further keep the sand out of the tunnel, excelsior was jammed in all the cracks.

Workmen proceeded cautiously in placing additional sets of ribs lest they lose the face to the incoming sand. First, spiling were driven under the next to last set placed, and over the last. Sand was hand excavated from the top of the tunnel and a partial bulkhead placed at the face. As more spiling were driven, the bulkhead was gradually extended down until another steel rib set could be placed. Then a mucking machine cleaned up the face and the process was repeated.

• **Pumps needed**—A large pumping installation removed water seeping into the sandy part of the tunnel. These pumped through 8-in. dia pipes that discharged into the existing 5-ft tunnel. For 1,200 ft where the water problem was particularly bad, a well-point installation was made in the tunnel. Spacing of the 1½-in. dia well points averaged 5 ft. As the tunnel is being concrete lined, this water will be effectively shut off.

The sand excavation involved about half of the section 2 tunnel development. The other half was through sturdy dry Altamira shale. For this work four drifters fastened to hydraulic jibs were mounted on a drill jumbo. By use of the jibs, workmen easily positioned the machines to drill the 30 holes required for each round. Then they used 50- and 40% powder and blasting caps with eight delays to pull 4½ ft. Advance in the shale averaged 40 ft a day.

On the first section of tunnel, spoil was hauled out at portal level and dumped. However, for the tunnel worked from the shaft, excavated material was hoisted to the surface in a muck skip.

As the tunnel was dug, utility lines were installed. These included 21-in. dia spiral-reinforced air tubes that could be used either to suck air out of the tunnel or to force air into it. Blowers located on the surface had a capacity of 8,500 cfm. Compressed air lines were also installed. These provided air at 100 psi to operate pneumatic hammers and spades. Some rock drilling equipment was also involved. Other utilities included fresh water and both 440- and 110-v power lines.

• **Connection between tunnels**—In connecting the first 2 miles of the new 12-ft sewer with the existing 5-ft tunnel, special precautions were required because the 5-ft tunnel was operating under pressure. At the point of connection, center lines of the two tunnels are 20 ft apart and invert elevations differ by 10 ft, the new tunnel being higher than the old one.

• **Connection**—A cross-drift connects at right angles to the new 12-ft dia tunnel. This chamber was simply a reinforced concrete room with inside dimensions of 8 ft 6 in. by 17 ft 8 in. in plan and a height of 9 ft 6 in. A shaft 5 ft 6 in. dia was driven from this chamber down to the old tunnel. However, the break through had to be made under pressure.

Entryway between the new tunnel and the connection chamber is a 5-ft dia steel nipple. A semi-portable air-lock 8 ft long and 5 ft in diameter was bolted directly to the flange of the nipple. Thus, workmen could enter the airlock, stay until pressure built up, and then enter the connection chamber. Nipples for air connections were cast into the concrete between the tunnel and the connection chamber.

When everything was in readiness for the connection, workmen entered the connection chamber under pressure and gradually chipped out a rectangular hole, 3x5 ft, in the top of the old tunnel. Material removed was passed out through the airlock. Air pressure was maintained to prevent the upsurge of water from the old tunnel.

When the hole was finished, the men left the connecting chamber and air pressure was gradually reduced. This permitted treated effluent to enter, but a flap gate prevented effluent from backflowing into the new tunnel from the connection chamber.

A similar plan will be followed this fall when the second section is connected into the tunnel system. However, at the shaft, the two tunnels are 150 ft apart instead of 20 ft and are at the same elevation instead of differing by 10 ft. Thus, it will be necessary to incline the connecting tunnel upward so it will come over the top of the old tunnel.

Then the section of new tunnel already in service will be dewatered (must be during a low flow period so the old 5-ft tunnel will handle the entire flow). Next, the bulkhead at the end between the two portions of new tunnel will be removed. A 48-in. shaft is available to remove bulkhead materials.

• **Second section**—The second tunnel section was holed through in April, 1950. Concrete lining work started immediately and is now under way. Invert concrete was placed in the invert and work on the arch will follow. This lining work is carried out by pumping transit-mix concrete behind movable forms.

A. M. Rown is chief engineer and general manager of the Los Angeles County Sanitation Districts and C. R. Compton is assistant chief engineer. Fred D. Bowlus supervised design and is resident engineer on construction of the new tunnel. N. S. Marchment is superintendent and Richard Colman is assistant superintendent on the tunnel construction. The work is being done by employees of the districts.

More Space in Low-Rent Housing

More space for eating, sleeping, storage and indoor play is held to be a big need in low rent housing. Local housing authorities that now have projects under construction or on the drawing board are doing their best to provide it, according to the JOURNAL OF HOUSING, organ of the National Association of Housing Officials.

At least four cities that have already broken ground for new projects or that soon will are including a larger proportion of three- and four-bedroom units than previously built; and one is building a project with five-bedroom units. New Orleans will have 36 three-bedroom and 34 four-bedroom dwellings in a 234-unit project. Atlantic City is building 32 three-bedroom and six four-bedroom units in a 164-unit project. St. Louis plans 276 three-bedroom, 36 four-bedroom and 12 five-bedroom units in a 704 dwelling project.

Ideas for more suitable living units for low rent families proposed by management and maintenance personnel of the Louisville Housing Commission include larger master bedrooms to permit crib space for two small children, and larger kitchens in four-, five- and six-room apartments so that large families can eat together.

The Committee on the Hygiene of Housing of the American Public Health Association has recommended 400 sq ft of floor space for one person, 800 for two people, 1,000 for a three-person family, 1,200 for a four-person family, 1,450 for a five-person family and 1,550 of space for a six-person family.

Find Out How to Treat Industrial Wastes

IT COSTS A LOT OF MONEY to study your industrial wastes. But it will cost you a lot more if you build a treatment plant without investigating them thoroughly.

This is one big reason for The Atlantic Refining Company's well-equipped waste control laboratory in Philadelphia. The $108,000 lab—which costs more than $100,000 a year to operate—is a vital link in the Point Breeze Refinery's waste control organization. This organization includes—in addition to the lab—operating and engineering sections more directly concerned with plant servicing. The *O* and *E* sections, however, depend daily on the lab for help in solving waste problems.

• **The lab's job**—The principal functions of the laboratory are: Investigate waste disposal as well as water supply problems. Conduct laboratory and pilot plant research. Recommend corrective measures and procedures. Provide data for engineering design of new and revamped installations; and Train operating employees technically to control waste and water treatment facilities.

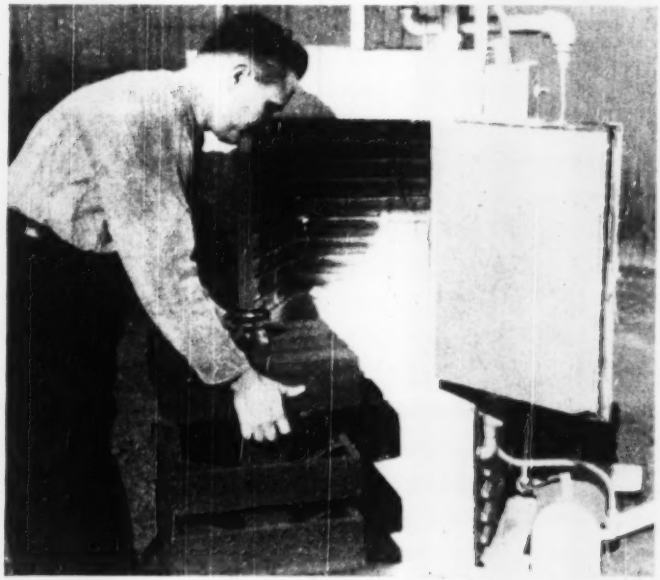
The lab has 3,500 sq ft for mineral and sanitary analyses. It is enclosed in aluminum sheet metal on a steel work frame. Concrete floors are covered with asphalt tile. Ample window space for natural lighting is supplemented by fluorescent lamps. Additional space includes a 500 sq ft bacteriology laboratory and 1500 sq ft of offices and locker rooms.

Utilities provided include: Hot and cold water; steam; air; gas; vacuum; distilled water; refrigeration; oxygen and carbon dioxide. Electric power is both 60-cycle, 110-, 220-, and 440-v ac and 110-v dc.

• **Staff**—The waste control organization consists of 55 employees of which seven skilled chemists and assistants are attached to the laboratory. Waste control is under the general supervision of W. B. Hutt, service superintendent with immediate direction of the three sections by Roy F. Weston, sanitary engineer. Joseph DeMann (in photos) directs laboratory work.

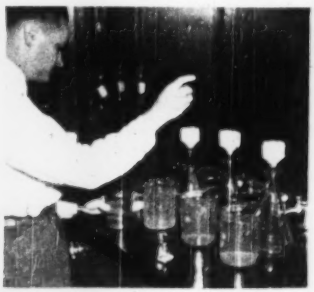
Because the refinery is under consent order by Pennsylvania's Sanitary Water Board to proceed with the construction of a complete treatment plant by the end of 1952, the laboratory is constantly studying waste characteristics and making recommendations for effective, low-cost processing. Some routine tests made in the well-equipped lab are:

Waste waters are sampled automatically . . .



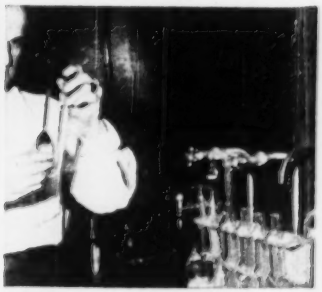
COMPOSITED by a 2-rpm scoop (above unit) and refrigerated during collection, a sample goes to the laboratory for mineral, sanitary and bacteria analysis.

Oil is removed by flocculation and solvent extracted . . .



1 Added ferric chloride forms a floc that settles with adhering oil. Vacuum filtered retained floc is dried . . .

2 Dry floc is put in a crucible and refluxed with a solvent to extract the oil. In a special tube . . .

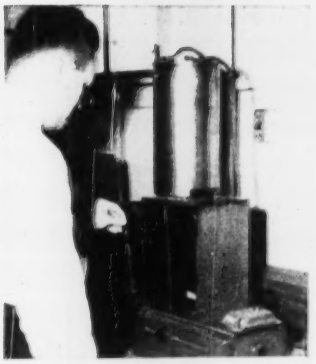


3 Solvent is driven off by heating. Oil content is read directly in ppm on the calibrated capillary tube.

Phenolic compounds are distilled off . . .

1 Interfering substances in waste-water samples are chemically flocculated and settled out . . .

2 Phenolic compounds in four samples are distilled off under the chemist's close supervision . . .



3 With color-forming reagent in sample, amount of phenol is measured quickly with a photo electric cell.

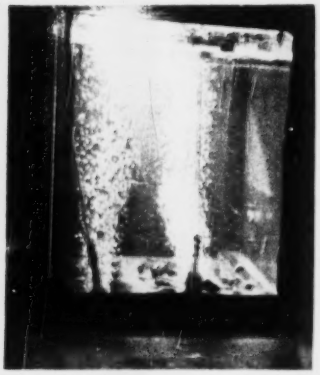
Chemical Oxygen Demand is measured by . . .

1 Digesting samples with iodic acid in Kjeldahl flasks 1 hr at 190 deg C in a constant temperature bath . . .

2 After digestion, samples are put into a large flask with distilled water and steam distilled . . .

3 And finally—chemical oxygen demand is measured indirectly by volumetric titration.

Aquatic-life toxicity tests made in bio-assay laboratory . . .



1 Fish are acclimatized at constant temperature before used in tests.

2 Oxygen is fed continuously into diluted wastes under glass funnels.

3 After 1-4 days in diluted wastes, autopsies are done on fish specimens.

Biochemical Oxygen Demand is determined . . .

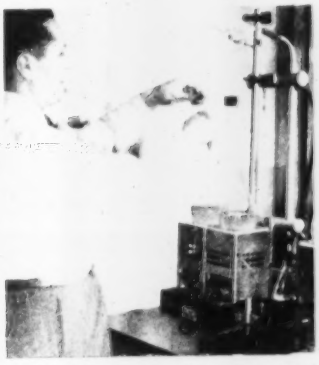
1 Reagents added to aerated-aged distilled water yield diluent for BOD tests of waste sample aliquots . . .

2 Diluent, waste and dilution water are added to test bottles. Samples are incubated at 20 deg C for five days . . .

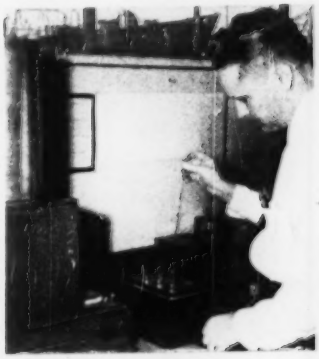
3 Dissolved oxygen in samples is found by adding reagents and titrating. BOD is figured from DO lost in incubation.

Total Organic Nitrogen is evaluated . . .

1 The chemist removes samples that have been digested in acid medium for several hours . . .

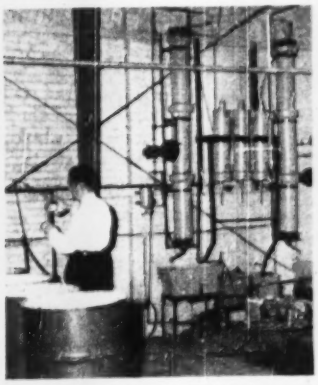


2 Made alkaline, samples are distilled for ammonia content by the Kjeldahl method . . .

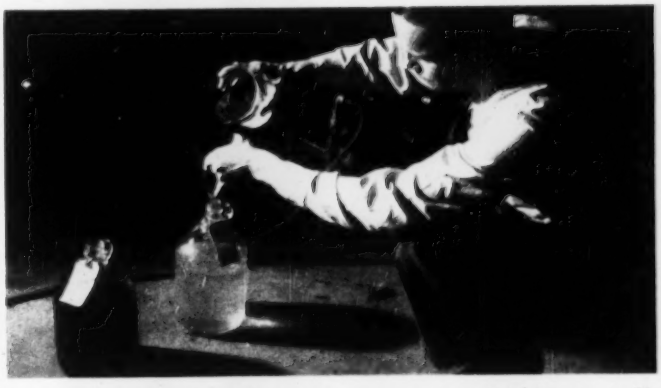


3 Ammonia in aliquots of samples is determined photometrically after direct Nesslerization.

Biological oxidation of petroleum wastes . . .



1 A twin pilot plant can walk processes wastes not chemically treatable.



2 Efficiencies of the biological treatment process range from 60 to 98 percent. The result: A clear effluent and a clear effluent sample.

HAMMER GRAB is both pick and shovel for sinking foundation pier casings. Hole is beneath rig's main sheave, whereas hammer grab is in dumping position below auxiliary arm, which will fold back, to position hammer for digging.

New Excavation Tool, The Hammer Grab Speeds Port Rebuilding At LeHavre

". . . reduces foundation costs by 40%, time by 50%"

McGraw Hill World News

LeHavre, most battered harbor on the European continent, already has regained its place to rank with Marseilles as France's foremost port. This comeback has been made possible by new construction techniques, several of which make use of the "hammer grab," a tool that digs and mucks for foundation caissons.

During the war all (11,100 ft) tidal quays were destroyed and buried beneath debris from fallen buildings and revolving cranes. Extensive clean-up work and temporary wharf building was done by U. S. Army engineers and LeHavre port authorities after the liberation, but only in 1946 did real reconstruction begin. First, sheds, roadways and railways were brought back into use; then attention was turned to the pier structures themselves.

The new quays are made of prefabricated slabs of prestressed concrete, supported on reinforced-concrete caisson foundations.

Of particular interest is the method of setting the caissons. This is known as the "Benoto process," since the machines used are manufactured by the French excavating equipment maker, Benoto.

• **The hammer grab**—The Benoto process consists of boring and excavating simultaneously with a special tool, the hammer grab—essentially a cylindrical weight on top of "orange peel-like cast steel jaws that pick the soil when the jaws are wedged in their open position, then enclose a "bite" of soil in their closed position. The hammer grab can be adapted to varying types of soil by a choice of several jaw types.

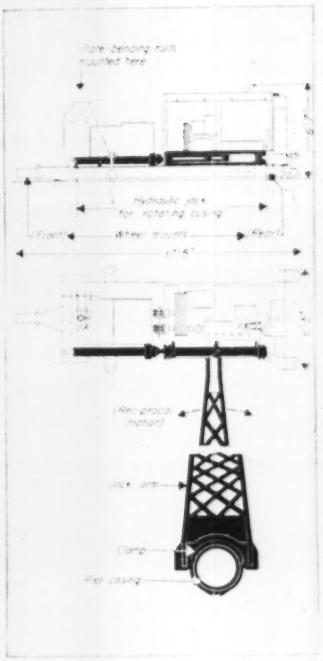
In general, the hammer grab is used in conjunction with a casing. While the ground is being excavated, the casing is simultaneously lowered by its own weight. Sinking may be augmented by a semi-rotary movement, imparted by a machine-operated lever arm attached to the casing's top. This action saves time in setting the casing, which sometimes attains its final position even before excavation is completed. When excavation is terminated, reinforcement is inserted and the casing is withdrawn as concreting progresses.

Boring equipment includes a drilling machine, a combination casing and rotary-motion machine, and one or more hammer-grabs with series of adaptable jaws.

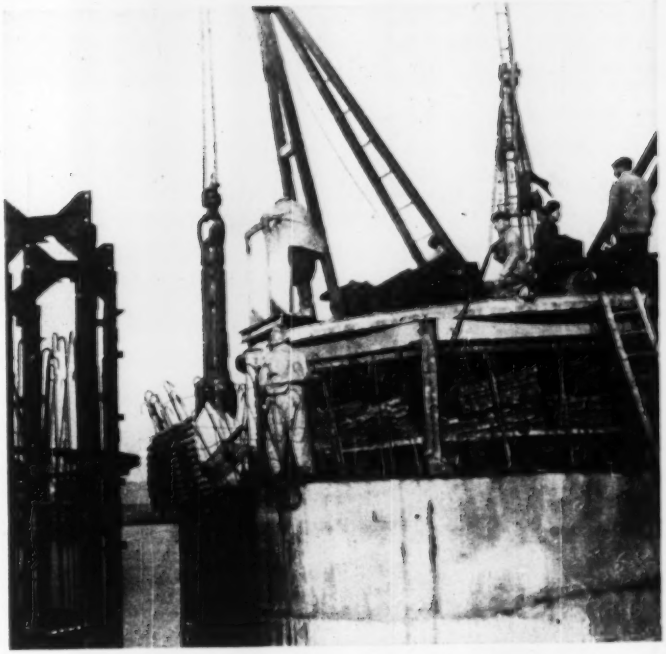
• **The drilling machine** consists of a rubber-tired chassis supporting a diesel-powered one-drum winch. A folding boom is attached to the front of the chassis. In working position the boom is held in place by two telescopic legs resting on the ground. These legs assure correct spotting, and they oppose the force necessary for extraction of the casing. An auxiliary boom arm swings the hammer grab away from the hole, for discharging muck outside the hole zone.

• **Casing sections** may be manufactured on the spot. The combination casing and rotary-motion machine mounts a set of rolls for bending flat sheets, an engine-generator for welding, also a hydraulic pump operating a cantilevered horizontal jack to which is fitted a collar to clamp around the casing. Movement of the jack is automatically reversed at the limits, or wherever the casing encounters undue resistance. This jack produces the semi-rotary movement.

The combination machine is fixed



CASING MACHINE combines: (1) rolls and welding machine, for manufacturing caisson shell, with (2) hydraulic jack for twisting shell downward into earth.



GABION SINKING.—Benoto-system rigs rotate on cylindrical concrete caisson, handling hammer grabs that undermine the cylinder's lower edge. Hammer grab's access is through closely-spaced circular dredge wells in caisson wall. Structural frame and reinforcing for another gabion shown at left.

firmly to the ground by stakes driven through holes in the chassis. Auxiliary equipment includes pneumatic-tire mounting for easy portability. The casing machine makes tubes of any required diameter. In preparation for driving, a serrated cutting collar is welded to the casing's lower rim.

• **Waterfront rehabilitation**—Application of the Benoto process at LeHavre is typified by the work on the Bellot wharf. Built of masonry, it collapsed when the tide locks were destroyed, damming the water from the basin and causing the wall to tilt under earth thrust. Part of LeHavre's harbor is behind lock gates so that ship-wharf activities can be carried on without inconvenience from the area's great tide range. Reconstruction on similar lines would have been difficult because of the instability of the ground, so a different waterfront-foundation design was adopted.

The new wharf, 4,000 ft long, is set on three rows of 5-ft piers spaced 50 ft c to c. Piers extend 100 to 140 ft, to a thick pebble or gault-clay stratum.

• **Mortar-injection concrete**—Ten-ft long casing sections of ¼-in. steel were sunk by the Benoto process, being welded together section by section as they were settled to place. Once bedrock was reached, reinforcement assemblies were inserted in the borings, then aggregates of from ¾ in. to 2½ in. size were fed in by belt conveyor. A grout was then introduced, from bottom to top, as the casings were withdrawn.

Vertical boring speed was 3.28 ft per hr. It required about 50 hours to bore a 100-ft shaft; 20 hours to place concrete aggregate, extract the casing and inject grout.

The Bellot sections are completed by setting precast slabs on the piers. This work is being carried out by Etablissements Campenon Bernard and Société de Construction des Batignolles.

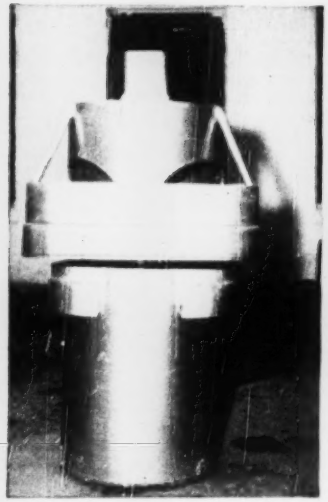
• **Does cylindrical caisson work, too**—A 1,100-ft extension of the Bellot wharf now is being constructed in the Eure tidal basin. These quays utilize concrete cylindrical caisson piers, excavated with small hammer grabs, by the Levean Co.

The cylindrical piers, called gabions, are built up in place as sinking proceeds. Dredging wells for the hammer grabs are spaced closely in the gabion's wall, so that the annular space beneath the wall may be excavated for sinking. Well excavation is supplemented by hammer grab work inside and outside the wall. Two or more small hammer grabs work from circular rails on top.

In another part of the harbor, some 600 ft of tidal wharves are being reconstructed by Schneider & Cie. As the surface in this case was unstable due to undermining and tidal movement, casings of reinforced concrete, to be left in place, were installed by the Benoto process. Like the steel-encased piers, the concrete-encased piers were filled with aggregate, followed by grout injection.

Reconstruction should be terminated by 1953. Total cost is estimated at $145,000,000. For foundation work it is estimated that the Benoto process reduces costs by 40 percent, time by 50 percent. Speed in reconstruction is vital, for LeHavre is France's gateway to the Atlantic, and of primary importance for trade with the United States. By 1948, imports, exports and passenger shipping already exceeded the pre-war level, by nearly 50 percent in many categories.

FIELD AND OFFICE



CUTTER-BUCKET—Lower portion has trap-door bottom, receives cuttings from projections as assembly is driven into previously bored bucket-size hole. Square-socket head aids driving alignment.

SOLDIER PILES—Reinforced concrete members, placed in cutter-bucket's semicircular holes, were lagged and braced during basement excavation, later became part of 24-in. concrete wall.

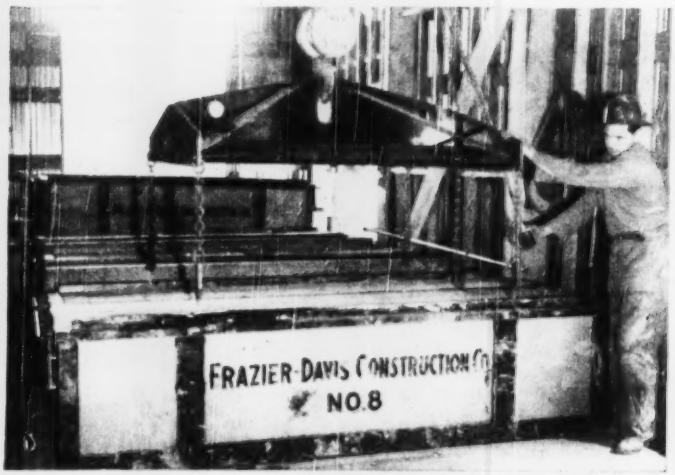
Cutter-Bucket Bores Semicircular Holes for Soldier Piles

Sure-Bottom Foundation Co., Houston, Tex., is accustomed to boring circular foundation-pier holes in the local stiff clay. Recently the company was asked to bore a semicircular hole. Here's how it was done: A round hole of 18-in. dia first was bored to required depth. Then a cutter-bucket, made for the semicircular-hole job, was set in the hole, for driving with an air hammer.

The bucket (lower portion of photo) is round hole size, has a trap-door bottom. The cutter consists of two flights. The lower flight consists of two curved ears that face rectangular notches in the bucket rim. The upper flight is a built-up plate bent to 200-deg central angle on a 15-in. radius. The plate is tangent with circular bucket at middle of cutter arc; it is tied back into the cover. This upper flight cutter is framed slightly above the bucket. (The resulting hole is not completely semicircular, it will be deduced.) A square-hole driving head receives a square rod, which can be kept from rotating, with a square-hole collar, so that the hole will be true throughout driving.

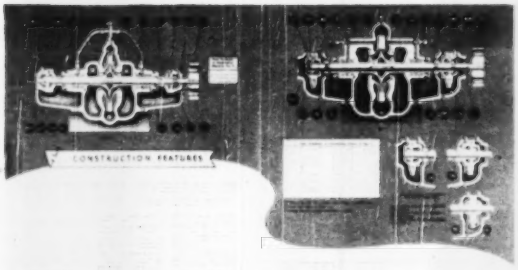
In driving, the lower flight makes a pilot cut and the upper flight completes the job, both shearing clay and forcing it inward, to drop into the bucket. When the bucket is full, it is withdrawn, emptied and replaced for further driving.

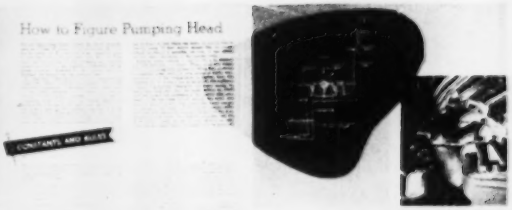
Sure-Bottom drove 156 of these holes, ten a day, for Tellepsen Construction Co., contractors for Houston's new Sakowitz store. Used to form reinforced-concrete "soldier piles" they were spaced at 42 in. along the foundation wall line. The soldier piles were lagged and braced during basement excavation, eventually becoming structural parts of a 24-in. retaining wall around three sides of the building.

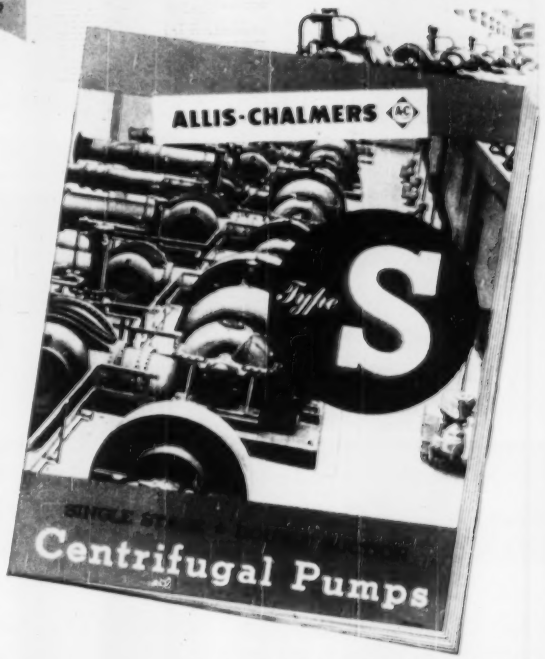


HANDY BATTERY HANDLING—For quick transfer of locomotive batteries powering haulage for Neversink Tunnel work (Grahamsville, N. Y.) Frazier-Davis devised this hoisting yoke in their battery-charging house. Five-ton hoist travels on beam, holds yoke that remains level as operator lowers away for four-point pick-up with . . .

EASY-ENGAGE HOOKS—When hooks reach slightly past slots, operator inserts hooks' downward projections, then hoists. Hooks engage automatically. (ENR photos)







How to Select and Apply Pumps

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READER COMMENT

Engineer Takes a Hand

Sir: It may interest you to know that Fred Ohrt, manager and chief engineer at the Board of Water Supply, was elected a delegate to the Hawaii State Constitutional Convention on March 21. A candidate from Hawaii's Fifth Representative District, Mr. Ohrt led a field of ten by a margin of 1,758 over the second contender. Five were elected. Mr. Ohrt received 15,823 of a total vote in the District of 30,102.

The convention was organized April 4 for a sixty-day session to draft a constitution for Hawaii, which is now awaiting action by the U. S. Senate on its bid for statehood. The House of Representatives has already approved admission of Hawaii to the federal union as a state.

Here in Hawaii the Constitutional Convention looms as a very important milestone in our historical progress towards ultimate achievement of full statehood in the union. Only those who have been faced with the problem of drawing up a state constitution can appreciate the ramifications of such a document and the fundamental importance of including adequate and proper provisions to insure the rights of the people and spell out the duties and responsibilities of the various branches of the government.

We, as engineers, are pleased to have Mr. Ohrt serve in this convention and are sure he will do an excellent job. Mr. Ohrt, in this case, is the exception to the usual rule where engineers are prone to leave political matters to members of other professions.

L. H. Herschler
Sanitary Engineer
Board of Water Supply
City and County of Honolulu

Safety in Prestressing

Sir: Reference is made to your editorial, "Safety Factor for Prestressing" published in Engineering News-Record April 13.

At present, primary interest and efforts concerning the economy of prestressed concrete are the applications of this type of construction to American methods. The economy of this construction is lost when European methods are transferred to this country.

In regard to the design safety factor, it is not generally known that our present AASHO design loads do not contain a safety factor. In fact, in some states, the legal limitations of truck loads permit heavier moment-producing vehicles than the present H20-S16 loading. To be comparable with our present design in both concrete and steel, we should use at least 1.8 live loads in prestressed concrete before cracking takes place. The basis of this reasoning is that structures built according to our present design will take at least that much overload before the yieldpoint of the material is reached. In many cases of concrete beams, the yieldpoint is not reached until 4 or 5 live loads have been applied due to the reserve strength acquired by our low unit dead load stresses.

One point that should not be overlooked is that after the prestressed concrete beam does crack, it does not act as a homogeneous material. Therefore, the stresses may be higher than calculated unless this is taken into consideration.

Consideration should be given to the fact that prestressed concrete does give a material superior to ordinary concrete. However, I do feel that we should proceed rather cautiously in setting up the design procedures.

Why is it that we develop new procedures and designs on an ultimate design basis and still maintain the unit stress basis in our presently used design methods? The economical consideration cannot be fairly made unless we proceed on the same basis of design.

Raymond Archibald
Bridge Consultant,
Bureau of Public Roads
Chairman, Bridge Comm., AASHO
Washington 25, D. C.

Correcton to Beam Formula

Sir: On p. 46 of the April 6 issue, the formula for equivalent *S* should read:

$$Equiv\ S = \frac{S}{50} L \times \frac{d}{bt}$$

where *L* is span in feet and S on the right-hand side of the equation is the section modulus required if the beam were laterally supported.

For a flexural working stress of 20,000 psi, the above formula can be written thus:

$$Equiv\ S = \frac{M}{833} L \times \frac{d}{bt}$$

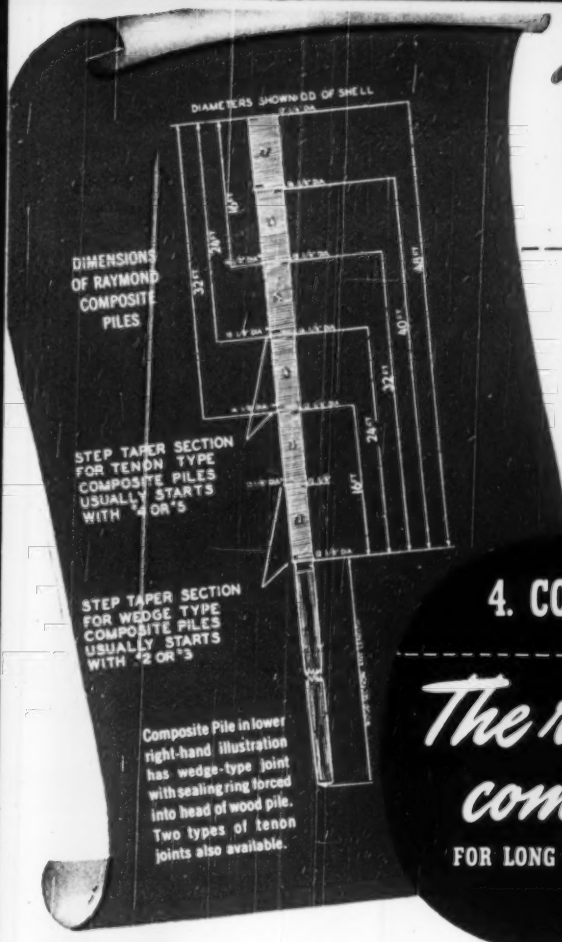
where M is the bending moment in foot-kips.

M. V. Pregnoff
Hall & Pregnoff
San Francisco 8, Calif.

Raymond MAKES 5 TYPES OF CONCRETE PILES

1. STANDARD . . . 2. STEP-TAPER . . .
3. PIPE STEP-TAPER . . . 4. COMPOSITE
5. GOW CAISSONS

Raymond installs every type of pile: cast-in-place concrete, precast concrete, steel pipe, wood and H-beam. Raymond operations include underpinning, borings and soil investigations, waterfront construction and harbor and river improvements, also cement mortar lining of pipes by the Centriline Corporation, a Raymond Subsidiary.

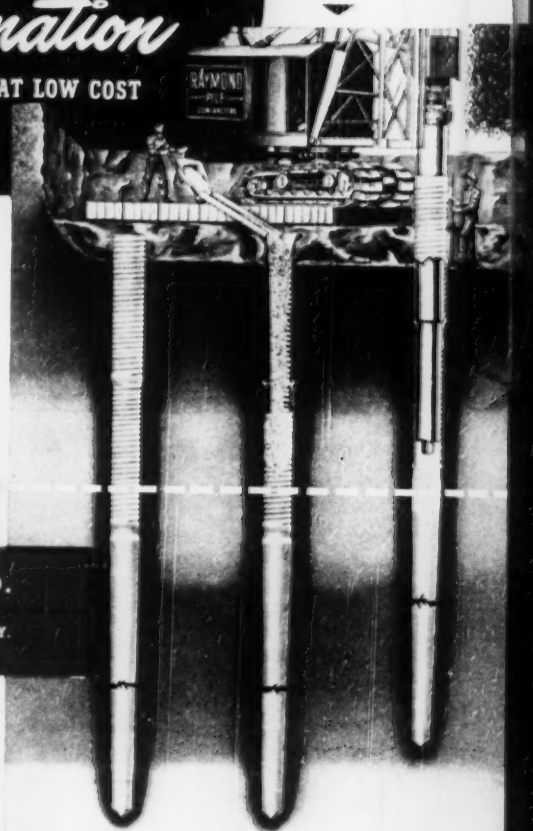

DIMENSIONS OF RAYMOND COMPOSITE PILES
STEP TAPER SECTION FOR TENON TYPE COMPOSITE PILES USUALLY STARTS WITH #4 OR #5
STEP TAPER SECTION FOR WEDGE TYPE COMPOSITE PILES USUALLY STARTS WITH #2 OR #3
Composite Pile in lower right-hand illustration has wedge-type joint with sealing ring forced into head of wood pile. Two types of tenon joints also available.

4. COMPOSITE PILES

The right combination

FOR LONG LENGTH AT LOW COST

Right, driven wood pile is being followed down by pile shell of concrete section. Center, complete pile driven to resistance, pile shell is being filled with concrete. Joint, wedge-type with sealing ring, is below ground-water level. Completed pile is shown at left.



Raymond Composite Piles are used for economy and long length. The concrete upper section extends from the permanent water table up to the underside of the footing, thus eliminating the expensive excavation, sheeting and pumping often required with wood piles.

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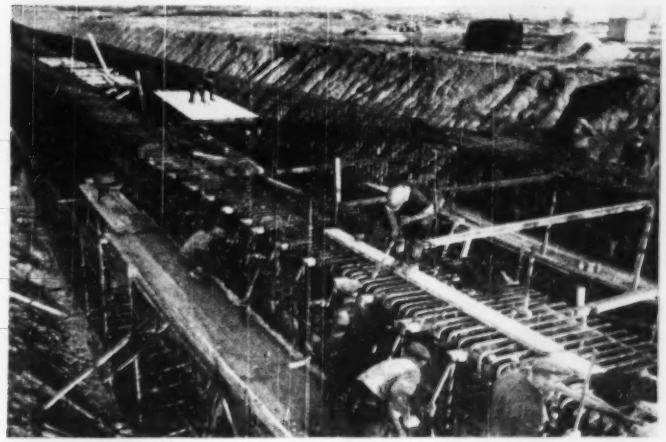


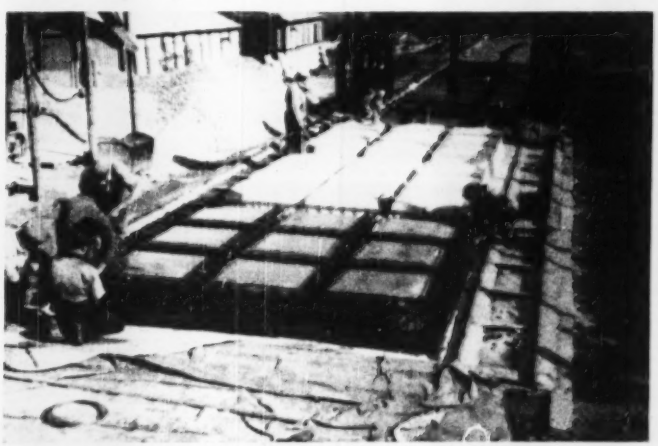
AIRPORT TRAFFIC TUNNEL—Workmen are laying concrete in one of four traffic tunnels running to the center of the new London Airport. The tunnels will carry all vehicular traffic, while aircraft taxi and fly overhead. The air field, one of the few big enough to handle the new Bristol Brabazon airliner, is already in regular use by civil airlines. (Eastern Pub. Service photo).

Belgians use new process in building reservoir

Engineers for the city of Brussels, Belgium, recently completed construction of a 100x120 ft x 12-ft concrete reservoir just outside the city, using vacuum processes for the work.

Methods were: The column footings and the floor were cast first. Then 80 columns, 12 in. in diameter and flared to 2 ft at the bottom by 18 in. at the top, were cast. These columns were cast with only two vacuum lined steel forms held to the floor by vacuum. External vibration was done by a very small vibrator affixed to the forms by vacuum. The forms were released half an hour after the concrete was poured, and used five times each day.

The 12 ft outside walls were cast similarly. Roof slabs were ribbed, cast in concrete molds, vacuum processed, and then lifted and set in place on the columns. The roof, incidentally, was figured for a load of 500 lb per sq ft because it is to carry 30 in. of



CONCRETE MOLDS—Pictured are 12 x 12 ft precast roof panels for the concrete reservoir at Brussels, Belgium.

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earth insulation plus live load.

Tie-wires attached to the top of the outside walls and run between the precast roof slabs to the opposite walls were prestressed by the Magnel-Blaton system. Only two heavy wires, with 12 ft spacing, were used for these ties.

A. Ackten is chief engineer for the Campagne Intercommunale Bruxelloise des Eaux, builders. The vacuum work was done under supervision of Jacques Arts, engineer of Syndicate Vacuum Concrete in Brussels.

Brazilian Pipe Line

A pipe line, to cost the government of Brazil about $7,500,000, is to be laid to link Sao Paulo with the petroleum refinery planned on the outskirts of the port of Santos. The length of the line is about 92 miles.

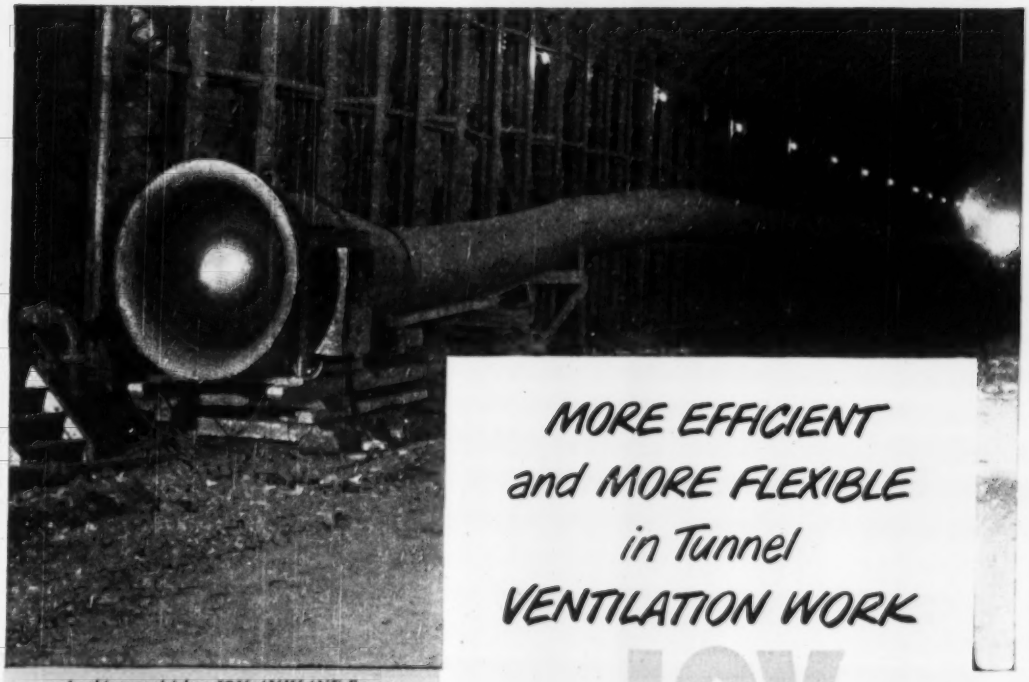
According to Leopoldo Miguez de Melo, engineer for the National Petroleum Council, there will be two parallel tubes—one 10 in. and the other 18 in. in diameter. The smaller one is for gasoline and kerosene, the larger one for heavier oil products.

Bridges

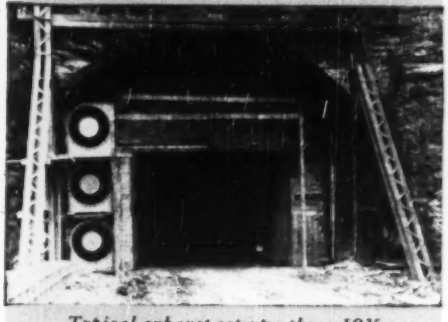
Scotland—An aluminum bascule bridge has been ordered for Victoria Dock, Aberdeen, by the Aberdeen Harbor Board from Head Wrightson Aldean Ltd., a subsidiary of Head Wrightson & Co. Ltd., of Thornaby-on-Tees, which designed and built a similar bridge across the entrance to Hendon Dock at Sunderland on the River Wear in England. Clear opening of the bridge will be 70 ft. Work will start at once and require two years for completion.

Siam—The Royal State Railways of Siam have placed a contract with the Cleveland Bridge and Engineering Co. Ltd., Darlington, England, for the construction of three bridges. Arrangements have been made for Dorman Long and Co., Ltd., to carry out all the work in Siam. Cleveland Bridge Co. will fabricate and deliver all steel work.

Start Puerto Rican dam—Work begins this month on the Loiza River Dam in Puerto Rico. It will be a concrete gravity type structure about 700 ft long, with spillway crest 60 ft above river bed. Reservoir capacity will be 6.5 billion gallons. Contract for the dam is held by Sumner S. Sollitt & Co., Chicago. It is expected to be complete in 1952. The dam will provide more water for metropolitan San Juan, adding 30 mgd to the present supply. Cost of the initial project is about $8,000,000.



In this tunnel job, a JOY AXIVANE Fan blows air to the face through lengths of flexible Spiratube.



Typical exhaust set-up—three JOY AXIVANE Fans mounted in the entrance of one of twin bores.

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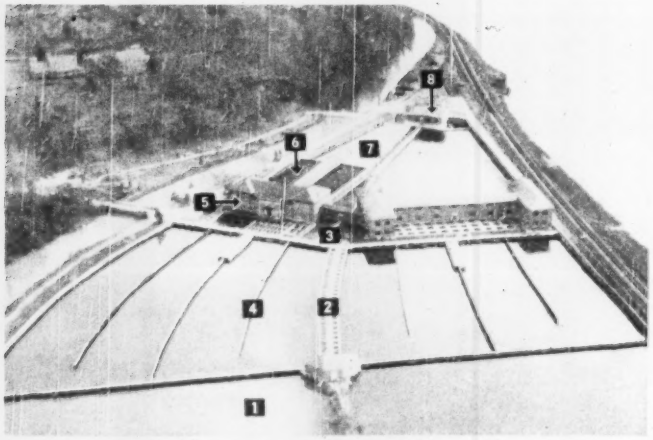
MUNICIPAL AFFAIRS



WATER PURIFICATION PLANT—A new water filter unit for Richmond, Va., was dedicated recently. The picture above shows both the old plant and the new addition. The elements are as follows: 1—settling basins; 2—canal; 3—mixing basin underneath grass; 4—coagulating basins; 5—concrete canal; 6—filters—indoors in old plant, outdoors in new; 7—aerator basin; 8—lime house.—Cavalier Photo

City planning—large and small

Two major city planning programs—one involving a multimillion-dollar development of the Port of Baltimore, Md., the other concerned with the healthy growth of Rapid City, S. D., were made public last week.

Of the two, the Baltimore program, sponsored by the city's Association of Commerce and city commission, appeared more likely of construction activity in the near future. Engineers for the Rapid City program admitted that the small city's present population (26,000) would have to consider financing and normal growth in its program, and suggested their plan be used as a guide to future action.

At Baltimore, the New York City consulting firm of Knappen, Tippetts, Abbett, Engineering Co. suggested a thirty-year, general-purpose improvement program that would involve the expenditure of more than $127,000,000. In addition, after a year-long study, the consultants suggested widening and deepening of navigation channels and improving provision of new access roads to the port area, more extensive use of the chemical handling equipment, establishment of a motor terminal, and other changes including a re-study of port city structures.

To handle the port's business, the engineers urged a revamping of present laws to establish a Port District Commission with powers to operate the port and its facilities and to give it other administrative functions, as opposed to the present commission, which has no actual administrative duties.

For Rapid City—which has hopes of growing to a 50,000 population within the next fifty years, A. C. Godward, Municipals consulting engineer, has suggested to city officials changes in zoning regulations, construction of new sections for the various state and federal highway routes that traverse the city, improved mass transportation facilities, and other betterments.

Huge housing projects

St. Louis, Mo.—A 75-year lease on Potters Field in southwest St. Louis is the key to the biggest housing project in the city's history was signed April 24. A building permit was issued April 25 to the Hampton Gardens Apartments, Inc., which owns the land. Plans call for 50 brick buildings in 12 groups on the 32½-acre tract, a total of 500 units. The units will occupy $500 acres plus all normal taxes on the land and improvements. There will be playgrounds, a park, and a parking area. Detailed plans were presented by Lamb & Abrams and Harrison M. Cory.

Boston, Mass.—Eugene Greenhut, of New York, has a $225,540,000 housing plan for what is known as the Cow Pasture section of Dorchester. Mr. Greenhut and his attorneys, representing the Urban Redevelopment Corporation of New York, have had several meetings with Boston Housing Authority officials, who are said to be divided on the matter. The principal issue is the legality and feasibility of the project, which would house about 2,000 families.

The main question seems to be can Boston afford such a huge development, which would mean the issuance of tax-exempt bonds to be purchased by private investors? Proposed rentals would range from $35 to $75 a month.

Municipal Briefs

Building code revision—The state building code of Connecticut is to be revised, and probably will be changed so that small towns can use it to fit their local problems and conditions.

A $100,000 leak—The City Planning Commission of Richmond, Va., has recommended an expenditure of $100,000 to stop the wasting of water in the Byrd Park reservoir. When last measured, the leak amounted to about 500,000 gpd. A new lining for the reservoir is required, according to utilities department engineers.

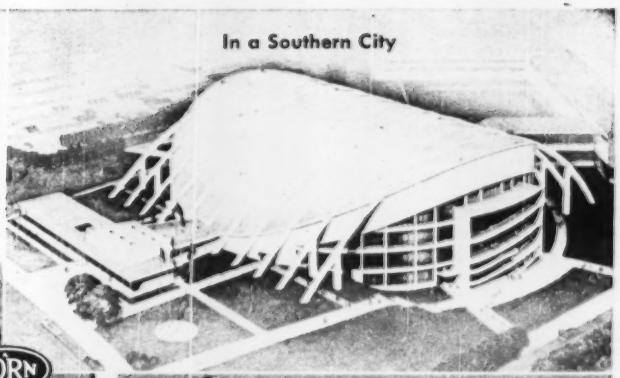
Small boat harbor—Revised plans for the Los Angeles small boat harbor at Marina Del Rey have been forwarded to Washington for congressional approval of funds for use by the Corps of Engineers in dredging the harbor at the mouth of La Ballona Creek. Mayor Fletcher Bowron forwarded the proposal to the Chief of Army Engineers, urging his support, and the county board of supervisors earmarked funds for land purchase. The new construction plan, approved by the city council and city planning commission, provides for building the harbor in three phases. The first would provide facilities for 2,000 boats.

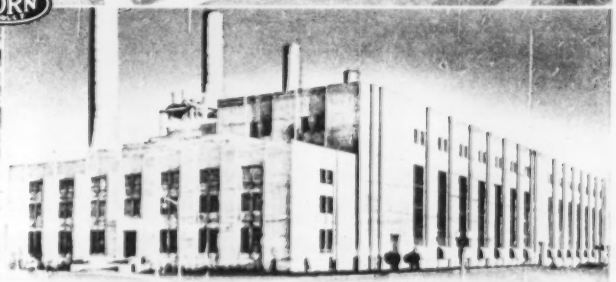
Truck parking lot—Chicago has opened at 2401-2537 South Aviland Ave., its first exclusive motor truck parking lot. It will have a capacity of 450 tractor trailers and will take 40 percent of that type of vehicle off the city streets. The lot is the first phase of a program designed to speed the flow of traffic through the Loop area especially.

Cambridge water improvements—Its water supply system, to cost $1,300,000, are being planned by Cambridge, Mass. Water mains laid 84 and 72 years ago will be replaced. Coagulation and sedimentation facilities of the filtration plant established in 1926 would be separated for greater efficiency.

At a Resort City

In a Southern City





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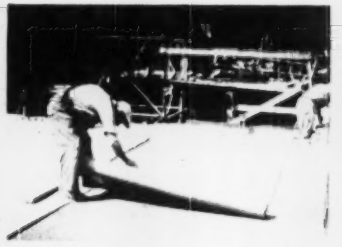

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MEN AND JOBS

Ray E. Murray has been appointed project engineer by the Chicago Land Clearance Commission, authorized by state law to raze slums for housing redevelopment by private enterprise. He held a similar position with the architectural firm of Skidmore, Owings and Merrill, and worked as a construction engineer on its project at Oak Ridge, Tenn.

Col. Robert E. York, now stationed in Japan, is expected to return soon to become Army district engineer at Fort Peck, Mont. **Lieut. Col. E. J. Gallagher** is acting district engineer.

Harold O. Egeberg and **Herman R. Horn,** both formerly with the Army Corps of Engineers, have been assigned to the Region 6 project planning branch of the Bureau of Reclamation. Egeberg previously had been an engineer with the Butte & Superior Mining Co. and had worked for Silver Bow County, the Montana highway commission, the state water conservation board, and the U.S.

Mike Dekum, superintendent for F. H. McGraw & Co., and W. H. Dodge, right, resident engineer for Russell & Axon, consulting engineers for Ocala, Fla., sewage-treatment project, are getting a good job done fast.

E. B. Perrin, right, vice-president of the Virginia Engineering Co. Inc., of Newport News, Va., is congratulated by Col. E. E. Gesler, North Atlantic Division engineer for the Army Engineers, for the expeditious completion of the 320-bed Veterans Hospital at Wilmington, Del. On March 19, 1948, the groundbreaking took place. Two years and two days later, March 21, 1950, the hospital was finished, all equipment installed, and patients hospitalized.

STANDARD ENGINEER'S REPORT

DATA

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UNITS 148 Diesel Engines

CONDITIONS Heavy-duty service 24-hour operation

PERIOD 13½ months

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Engine-cleaning oil cuts "down time" in half!

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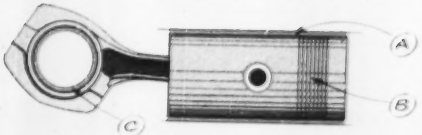
How RPM DELO Oils reduce wear, corrosion, oxidation in Tractor, Truck, and other Heavy Duty Engines



A. Contains special additives that provide metal-adhesion qualities . . . keep oil on parts whether hot or cold, running or idle.

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C. Special compounds stop corrosion of any bearing metal and foaming in crankcase.

HEAVY-DUTY DIESEL AND GASOLINE EQUIPMENT, owned by 8 contractors, moved over 12,000,000 cubic yards of earth on this cut and fill job—an extension to the Los Angeles Airport—in 13½ months! General Contractors are A. M. Ball & Sons, Berkeley; Harms Bros., Sacramento; H. Earl Parker, Inc., Marysville; Subcontractors, Lexis & Queen, Fresno; Louis Biasotti & Son, Stockton; Baker Bros., Chico; Gunner Corp., Pasadena; and Far West Construction Co. All used Standard Oil Company of California products 100%.

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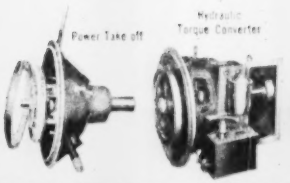

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CLUTCHES AND HYDRAULIC DRIVES
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Engineering department at Seattle, and before going to Billings was employed by the Army Engineers Corps at Walla Walla, Wash. Horn formerly was employed by the Iowa highway commission, the U.S. Department of Agriculture, the U.S. Engineering office and the Army Engineers.

B. V. Bevier is water superintendent in Salem, Ohio. He is a graduate of Ohio State University and was with the Ohio Department of Health as designer, construction superintendent of sewer and water projects, and public relations director, from 1924 to 1946. He was sanitary engineer for Mansfield, Ohio, from 1946 to 1949.

Preston L. Fite has resigned from the California State Division of Highways after 32 years. He had been senior highway engineer since 1951. He was district engineer for the National Commission of Roads of Mexico in 1925-26.

Rudolph G. Bessette, New Bedford, has been appointed director of the waterways division of the Massachusetts Public Works Department.

Roy S. Barton, who has completed 42 years with the N.Y. State Department of Public Works, has been appointed field representative for the N.Y. Good Roads Association for the counties of Broome, Chenango, Delaware, Otsego, Schoharie, Sullivan, Chemung and Tioga.

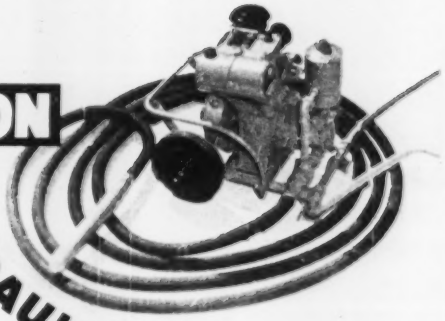
Frederick A. Thiessen, civil engineer and assistant New York State adjutant general since 1940, has retired after 47 years in state military service. A civil engineering graduate of Rensselaer Polytechnic Institute, Colonel Thiessen was employed more than 20 years with the Delaware & Hudson Railroad.

Charles R. Pease has been appointed secretary of the Maryland State Roads Commission. Mr. Pease first occupied the post under a temporary appointment since the retirement last summer of Luther H. Steiner, commission secretary for many years.

Everett Lanham has resigned as Decatur County, Ind., highway superintendent at Greensburg but will remain as county surveyor.

John P. Shannon, Covington, Ky., roadside improvement engineer, Kentucky highway department, has resigned. He will become landscape architect for the Baltimore County Planning Commission at Towson, Md.

The JACKSON HYDRAULIC VIBRATOR



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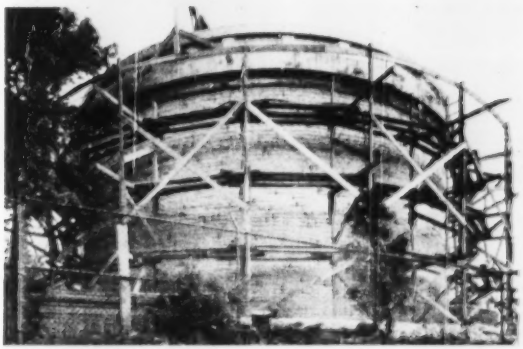

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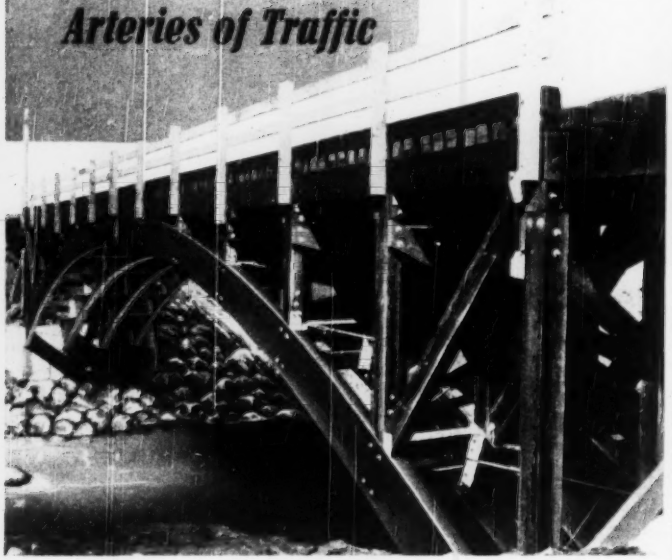
Muscle of Timber for Arteries of Traffic



Timber arch bridge built for Bohemia Lumber Co. over Culp Creek, near Eugene, Ore.

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L. D. Shuman, chief of the Operations Division in the Philadelphia district of the Army Engineers, is retiring after 46 years of government service, including 41 years with the Army Engineers. His first assignment was on port improvement in Manila. In 1909 he became connected with the Philadelphia Engineer district as junior engineer in charge of surveys on the Delaware River. He had an important part in the deepening of the channel of that river and its tributaries and in the improvement of other rivers and streams. During the First World War he was district engineer of the Philadelphia office.

J. E. Williams, Industrial Extension Service instructor of Texas A. & M. College, has been made superintendent of the city waterworks department at San Angelo, Tex.

Assistant City Engineer **Robert Allen** of Regina, Sask., has resigned after 45 years service.

John B. Allen has opened a Northwestern office in San Francisco for the James L. Barnes Construction Co., Logansport, Ind. He is general manager for the territory, having moved up from assistant in Barnes' Los Angeles office.

Walter E. Riley and **Frank J. Foltz** have organized a consulting engineering firm in Phoenix, Ariz. Riley previously was on the engineering staff of the Pittsburgh-Des Moines Steel Co.

Donald R. Hanson of the planning division of the Chicago Housing Authority, has been named executive director of the newly organized Indianapolis Housing Authority. He is a graduate in civil engineering from Purdue University. During the war he was a captain in the Army Engineering Corps.

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Faster-on-the-job, the FWD Maintainer covers ***more*** miles per day . . . creating unmatched savings in time and money. Maintaining at 1 to 12 mph, finishing at speeds up to 20 mph, it keeps your roads in best possible condition. Travel-speed up to 42 mph cuts time to and from work . . . broadens the Maintainer's daily operating range and permits more actual on-the-job service. Write for full facts—or see your FWD distributor.

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Hauls, tows, plows snow — does over 60 different jobs economically.

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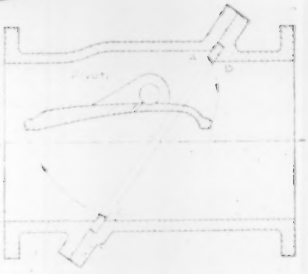
There's no slamming of the disc with Chapman Check Valves . . .no troubles with water-hammer. And that means . . . no pipe line vibration, no danger of opening up joints. It's truly the valve with *cushioned closing.*

No wonder Chapman Tilting Disc Check Valves are noted for reducing maintenance cost. Noted, too, for effecting savings of from 65% to 80% in head losses over conventional type check valves. Why not write today for engineering data?



Cross section of the Chapman Tilting Disc Check Valve illustrating the way that the balanced disc is supported on the pivot, with arrows showing the travel of the disc. A feature of the design is that the disc seat lifts away from the body seat when opening, and drops into contact when closing, with no sliding or wearing of the seats.

The Chapman Valve Mfg. Co.

INDIAN ORCHARD, MASS.

EDUCATION and RESEARCH

AT SECOND ANNUAL CONFERENCE on street and highway problems held recently in Los Angeles by the University of California's Institute of Transportation and Traffic Engineering, R. H. Baldock, left, Oregon state highway engineer confers with R. A. Moyer, research engineer with the institute, and chairman of the Highway Research Board, National Research Council.

Study chert aggregate

According to Bryant Mather of the concrete research division, Waterways Experiment Station, Jackson, Miss., there are many important unsolved problems concerning the composition, origin and use of chert even though it is one of the most common materials in gravel deposits in many states. Chert is a massive, dispersed mineral of neutral or dark color, closely allied to flint.

Mr. Mather told the Earth Science section of the Mississippi Academy of Science that, as part of the civil works investigation of the Corps of Engineers, an intensive study is being made of the nature of the material in various chert gravels. The study may explain why some concrete made with chert aggregate gave unsatisfactory service while other concrete made with apparently similar chert has been entirely satisfactory.

As a result of this investigation, it is expected that the Corps of Engineers will be able to develop tests that will permit the making of high quality concrete from certain low cost chert aggregates which at present are regarded as unsatisfactory. If this succeeds, a considerable saving in the cost of materials for concrete construction would be realized.

Special courses

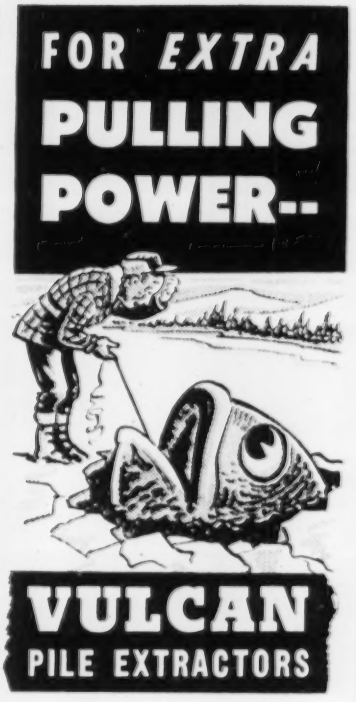
For building inspectors—The school of engineering and the technical extension division of Purdue University, together with the Midwest Conference of Building Officials and Inspectors, recently sponsored a three-day school for building inspectors. Among the subjects discussed were: Administrative problems, individual water supply and waste disposal, soil properties and footings, design of concrete mixes, materials testing, building materials, zoning, occupancy, air pollution, and safety measures.

Measuring air masses—The influence of topography in the diffusion of air contaminants is undergoing study in the engineering department of the University of California at Los Angeles with the aid of an instrument called a "shear-meter." Designed by H. F. Poppendiek and L. E. Vehrencamp of the research staff, it measures the draft force air masses exert on the earth's surface. Terrain features of the area under study are reproduced in miniature on a base floating in a tank of water, and drag forces are measured by means of sensitive coil springs attached to the model. Poppendiek said theories attributing atmospheric turbulence and terrain features to pollution dispersion would receive thorough investigation and scientific cataloging as a result of the experiments.

Educational Notes

Women engineers elect—Four civils were among the 73 women engineers attending the second annual conference of the Society of Women Engineers held May 27 and 28 at Green Engineering Camp, Cooper Union, Ringwood, N. J.

Phyllis Evans, of Drexel Institute, presided as president over the business meeting at which the society's membership requirements were softened from student to graduate to qualify for full membership after April 1, 1953. Four years of engineering experience will be accepted in lieu of graduation from an accredited engineering college. Mrs. Beatrice Hicks Chipp, vice president and chief engineer of Newark Boiler and Regulator Co., Bloomfield, N. J., was elected president for the coming year, and Miss Phyllis Evans, is the new secretary. Miss Ruth Bowden, senior civil engineering student at Cooper Union, was convention chairman. Prof. Mary Blade of Cooper Union was faculty adviser to the conference.



With Vulcan on the job, you've got all the extra pile pulling power you'll ever need in one dependable machine. All claims made for the efficiency, ruggedness and speed of this great pile extractor have been proved again and again through two decades of heavy duty service all over America.

The Vulcan is a simple machine with only one moving part. It's easy to operate and it can't get out of order. Designed specifically for pulling sheet steel, wood, concrete, H-beams and pipe pile. Vulcan comes in three sizes—No. 200 for smaller work, No. 400 for heavier jobs and No. 800 for pulling the longest, toughest piles. Write for complete details.

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HELIOS* dry developed, positive line prints on white backgrounds are exactly like your originals. You can count on their uniformity, crispness and clearness, whether the lines are black, blue or maroon.

K&E shoot for dependability in every item of their HELIOS line. They established a special plant to produce HELIOS materials exclusively—even the image-forming chemical components. So, HELIOS papers, cloths and films are the result of 83 years of K&E thoroughness and K&E zeal for perfection.

You can have HELIOS in opaque papers and opaque cloth for working prints, besides transparent papers and cloth, and clear and matte films, for intermediate originals (to use in place of originals).

You can print and develop HELIOS reproductions easily with any dry diazo ammonia process machine—even in a small office. No water, no wet mess, no plumbing—just a few seconds of a simple vapor treatment, and the job is done.

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Yes, sir, there's a long pedigree to every K&E PARAGON* Surveying Instrument.

When you buy surveying instruments, you're not buying toothpicks or neckties. You're buying accuracy and endurance for a lifetime. And you're spending real money.

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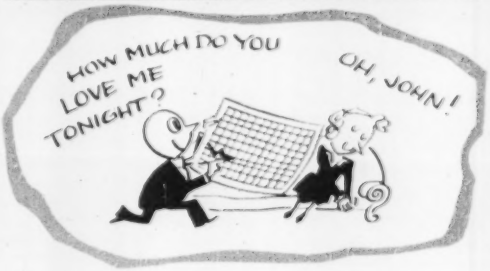
These questions are all pretty well answered in Keuffel & Esser's 83-year-old reputation for making mighty good things for engineers and draftsmen. For 83 years, K&E equipment and materials have been partners in nearly every engineering project of any size anywhere. So, that's why I say: buy K&E PARAGON Surveying Instruments.

K&E make 300 different kinds of *Graph Sheets*



What do you want to graph—Grandma's health or variations in the price of spinach—polar coordinates or the surface tension of prunes?

K&E have a graph form for almost anything. Ask your K&E distributor or the factory for a catalog of their 300 forms, or if you need one they don't have, maybe they'll make up one for you, tailor-made.

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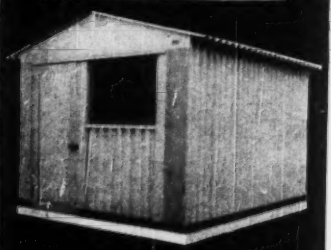
LOW COST
STEEL BUILDING
OF
1,000 USES



Portable or Permanent
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HANDY-HUT
No Field Welding or Riveting
2 Men Can Erect
Expansible!

Just the ticket for a field office, tool house, storage house, pump house or any one of a thousand uses for contractors and engineers. The USF Handy-Hut is an all-steel, prefabricated formed steel frame that simply bolts together with box corrugated roofing and siding sheets that attach with clip-and-wedge fasteners. No special tools are needed, no field punching, welding or riveting is required. Meets fire and windage codes most localities and is suitable for either permanent or portable use. Multiple units may be erected to accommodate any size requirement without special engineering.

USF also produces larger steel buildings of the same general construction in 10' and 12' clear heights with 26' or 30' span widths for erection in length multiples of 13'-4" to any desired size.

WRITE FOR DATA

USF United Steel Fabricators, Inc.
WOOSTER, OHIO

OBITUARY

Joseph Halveck, 66, hydraulic engineer for the Worthington Pump and Machinery Corp. of Harrison, N. J., died in Montclair, N. J., May 20.

John R. Stewart, 90, former town engineer of Renfrew, Ont., for 45 years, died recently.

W. H. Anderson, 61, Asheville, N. C., building contractor, died May 19. His construction firm built many of North Carolina's roads, including several sections of the Blue Ridge Parkway, and its activities extended into Virginia, Kentucky, West Virginia and other nearby states. He was president of the W. H. Anderson Construction Co., and the Asheville Contracting Co. He helped build the Murray Dam at Columbia, S. C. He also did considerable construction work for the Chesapeake and Ohio, the Norfolk and Western, and the Clinchfield Railroad companies in Virginia, West Virginia and Kentucky.

C. Donald MacDonald, 41, consulting engineer and formerly a professor of civil engineering at Mount Allison University, Sackville, N. B., died at Amherst, N. S., May 12.

Joseph P. Donlay, 61, general contractor of Buffalo, N. Y., died May 17. He had been a partner in the Border Building Co., since 1935. He was president of several construction companies, including the Allenhurst Gardens, Inc., D. & H. Development Co. and Allur Corp. He was a past president of the Buffalo Builders Exchange.

Cambridge Munro Trott, 62, president of Charleston Constructors, Inc., engineers and contractors, died May 18 at Charleston, S. C. Mr. Trott was graduated from Clemson College, S. C., with the degree of civil engineer. For two years before World I he was with the United States' district engineers office in Charleston. For a year he worked in the U. S. Department of Agriculture, doing drainage and survey work in North and South Carolina. During World War I he served as a captain in the 30th Engineers, 81st division, spending 11 months in France. After the war he was associated with the Charleston Engineering Contracting Co.; later becoming president of Charleston Constructors when it was organized.

James W. McGuire, 84, engineer and retired Coast and Geodetic Survey cartographer, died May 21 in Washington, D. C. He had been a resident of Washington for the last 40 years and retired about 15 years ago after more than 30 years with the government. He was recalled during World War II to do special mapping of the ocean floors. During World War I he was chief cartographer on a confidential advisory board.

John M. Basham, 61, retired civil engineer, died April 27 in Placerville, Calif.

John B. MacDonald, 66, civil engineer and president of the engineering firm of MacDonald & MacDonald, died at Vancouver, B. C., recently.

William W. Cruse, 74, retired engineer of Jefferson County, Ky., died in Middletown, Ky., May 2. He had been with the road department for 50 years.

John Marshall Dozier, Sr., 72, civil engineer and builder, died May 5 in Yorktown, Va. In earlier days, Mr. Dozier's Newport News Contracting and Engineering Co. built the first dirigible mooring masts for the Navy, plane hangars at the Panama Canal Zone, and the West Point Stadium.

A. J. Shellum, 47, an assistant civil engineer in the Seattle, Wash., city engineering department, died May 21. A 1925 graduate of Univ. of Washington, he was with city since 1926.

S. Howard Rippey, 74, retired consulting engineer, died May 18 at Philadelphia, Pa. He was associated with the late Coleman Sellers in developing the Niagara Falls hydro-electric plants. He later became a partner with Sellers in the firm of Sellers and Rippey.

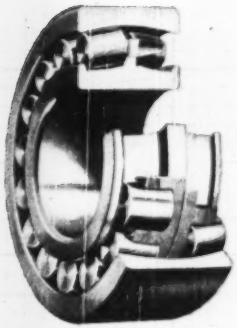
William P. Hammersley, formerly a member of the Massachusetts Highway Commission and town manager, Norwood, Mass., died at Hatwichport, Mass., May 22. He served the commission from 1902 to 1915, and as town manager of Norwood, 1917 to 1925.

Sir Ralph Freeman, designer and builder of the 50,000-ton Harbor Arch Bridge, Sydney, Australia, completed in 1932, died in England recently.

James Berrall, 81, for 45 years a civil engineer in Washington, D. C., died there May 25. During World War I, Mr. Berrall was civil engineer and superintendent for the Geo. A. Fuller Co., in construction of the Marine barracks at Quantico, Va. Previously he was the chief engineer in planning the layout of the Vanderbilt estate near Asheville, N. C. Latterly he had been engineer for the Washington Cathedral, the Pan American Union and the Interior Department.

Marion type 43-M excavators swing smoothly into every job

on TORRINGTON SPHERICAL ROLLER BEARINGS



SPHERICAL ROLLER
TAPERED ROLLER
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The Marion Type 43-M excavator is designed for all-purpose work—as a one cubic-yard shovel, clamshell, dragline, backhoe, crane or pile driver. It's also designed to swing easily under load, with Torrington Spherical Roller Bearings on the center journal.

These heavy-duty bearings provide free-rolling self-alignment under shaft deflection. Uniform load distribution is maintained constantly, assuring long service life with minimum maintenance.

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TORRINGTON *SPHERICAL ROLLER* **BEARINGS**

WHERE CLEANLINESS COUNTS

specify

penta-
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FOR STADIUM SEATS THAT LAST LONGER
build with clean PENTA-PROTECTED wood

Stadium seats, which are especially subject to decay through constant exposure, can now be protected.

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For grandstands, loading docks, bridges—and any wood structure, build with PENTA-PROTECTED wood—the wood that's protected against decay and termites. For further information write Dow, Dept. PE-20-A.

THE CLEAN WOOD PRESERVATIVE!

What PENTA means to the utilities

Light, power and telephone companies are switching to PENTA. They've found that line crews prefer clean poles treated with PENTA. Long lasting PENTA protection means longer pole life and reduced maintenance costs.

THE DOW CHEMICAL COMPANY
MIDLAND, MICHIGAN

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penta-
chlorophenol

CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.
ELSIE EAVES, Manager J. A. MAHONEY, Reports M. R. ROESSLER, Statistics

WATER SUPPLY

BIDS ASKED

Tex., Barnes, R.A. ... $33,000

Tex., Corpus Christi, R.A. ... $49,900

Tex., Houston, Bids Asked On ... $31,000

Tex., Pasadena ... $49,900

LOW BIDDERS

Pa., Phila., Dist. P. Work, City Hall Annex, Water ... $236,500

CONTRACTS AWARDED

Calif., Seal Beach, City Council, 2nd St. Concrete ... $33,444

Okla., Idabel, Ex. ... $184,260

Tex., Houston, Harris County, Co. Commissioners Court, Water ... $65,000

SEWERS, WASTE DISPOSAL

BIDS ASKED

Tex., Carrizo Springs, R.A. ... $50,000

Tex., Houston, Bids Asked On ... $30,000

Tex., Houston, Bids Asked On ... $30,000

Tex., Pasadena, Bids Asked On ... $49,900

LOW BIDDERS

Calif., Lakewood, City Hall, Mun. ... $347,347

CONTRACTS AWARDED

N. Y., Freeport, ... $24,496

Okla., Idabel, ... $184,260

BRIDGES

BIDS ASKED

Virginia, ...

Suffolk Co., ...

New Jersey, ...

Gloucester, Camden and Burlington Counties, ...

New Jersey, ...

Hudson Co., ...

LOW BIDDERS

Indiana, State Hy. Comm., Marion Co., ... $108,195 ... $53,088 ... $97,591 ... $112,402 ... $129,924 ... $165,743

▲ New Jersey, Sea Girt, Borough Mgr., Trenton, Mercer Co., ... $2,310,658

Wash., Seattle, ... $62,245

CONTRACTS AWARDED

▲ N. Y., Atlantic Beach, ... $5,765,506

Wash., Seattle, ... $106,411

PROJECTS COVERED

Projects—By Size

Classes of Construction

Stages Reported

Symbols and Abbreviations Include

+	Federal Government
▲	Percent of $1,000,000 or over
B.A.	Bids Asked
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily

STREETS AND ROADS

BIDS ASKED

Vt., Salisbury, ...

Tex., Wichita Falls, City Hall, May 15, ... $161,341

LOW BIDDERS

† Fla., Key West, ... $199,748 ... $140,512 ... $144,928 ... $301,340

Louisiana, State Dept. of Highways, Baton Rouge, May 31, ... $595,628

Louisiana, State Dept. of Highways, Baton Rouge, May 31, ... $58,487

Pa., Phila., Dist. P. Work, City Hall Annex, Streets, ... $1,383 ... $57,175 ... $68,172

CONTRACTS AWARDED

† Va., Quantico, U.S.A. ... $129,000

Wash., Edwards, U.S.A. ... $10,000

Tex., Houston, Bids Asked On ... $30,000

Tex., Houston, Bids Asked On ... $30,000

Tex., Pasadena, Bids Asked On ... $49,900

Any Good Contractor CAN DRIVE THIS PILING

Are you passing up profit opportunities in foundation work? Many general contractors have found they can handle these jobs profitably and efficiently with the aid of Armco Pipe. They get these important advantages:

1. NO SPECIAL DRIVING EQUIPMENT is required with either light or heavy Armco Pipe.
2. NO TOP REINFORCEMENT needed for driving pipe as light as ¼-inch wall, 14-inch diameter.
3. MILL-ATTACHED PLATE ENDS, cone points or cutting shoes save time and trouble in the field.
4. CUTOFFS CAN BE SALVAGED economically because Armco Pipe is uniform in diameter.
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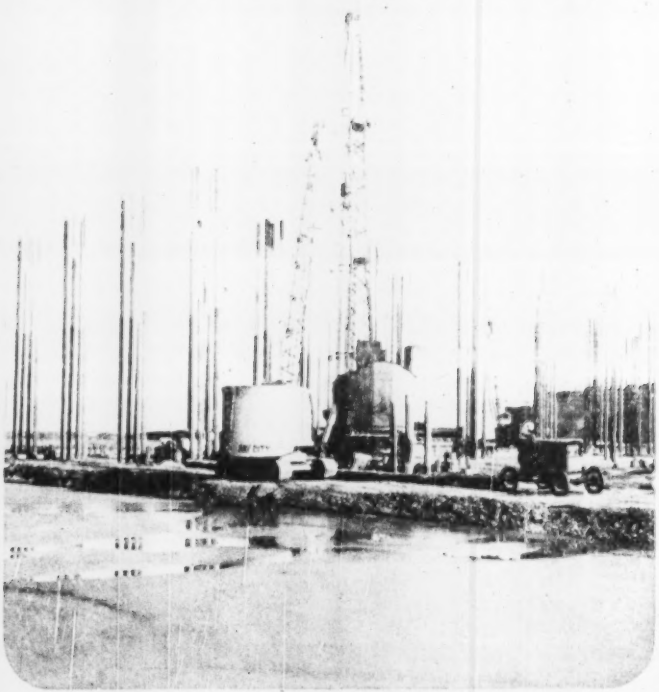
6. DRY PILES QUICKLY INSPECTED because Armco Pipe is straight driving and watertight.

It will pay you to get the complete story on Armco Foundation Pipe today. Just write to: Armco Drainage & Metal Products, Inc., Welded Pipe Sales Division, 5040 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation.

Export: The Armco International Corporation

ARMCO FOUNDATION PIPE

ARMCO



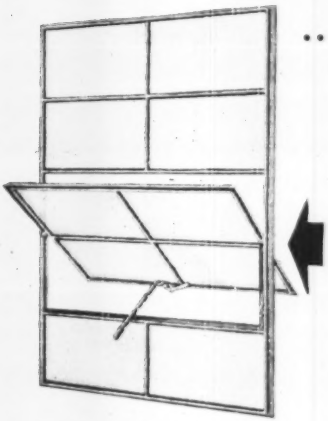
CONTRACTS AWARDED

EARTHWORK, WATERWAYS

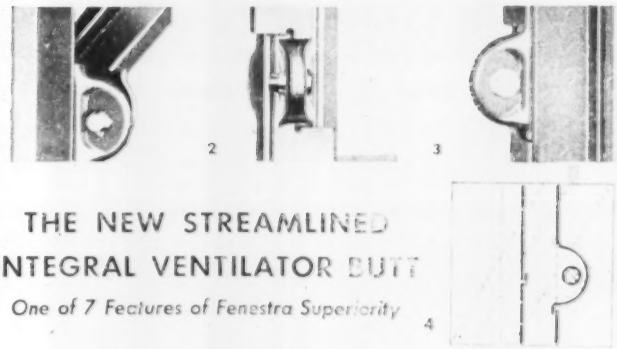
Tips on cutting window costs

If You Want To Cut Maintenance Costs

...look for this Window Feature



New Fenestra Pivoted Window



THE NEW STREAMLINED
INTEGRAL VENTILATOR BUTT

One of 7 Features of Fenestra Superiority

Above, you see the new Fenestra® Pivoted Steel Window and 4 views of the exclusive feature that slashes window maintenance . . . the new, streamlined *integral* butt which keeps vents fitting perfectly for complete weather-tightness. (1) Frame side (2) Head-on, inside view (3) Window side (4) Overlapping weathering sections. The butt has no protruding parts open to damage. Cup shape and drawn ribs give it special strength.

Fenestra Pivoted Windows are widely used for extra daylight, fresh air and see-through vision.

With slender lines and extra glass area, all Fenestra Industrial Steel Windows bring in extra daylight . . . reduce accident-tempting shadows. They bring in cool, clean fresh air, no matter what the weather—protecting ventilators guard the openings. They're good looking and rugged, warpproof and firesafe. They can be easily combined vertically or horizontally to form whole walls of windows.

Fenestra Windows cost less in three important ways: *Low first cost:* Standardization of types and sizes permits efficient volume production. *Low installation cost:* Modular sizes provide co-ordination of windows with wall materials. *Low maintenance cost:* Precision fabrication of strong, high-quality materials.

For plants, offices, labs, warehouses, commercial buildings and many others, Fenestra Industrial Steel Windows are your best bet for high quality at remarkably low cost.

Mail the coupon for types and sizes. Or call your Fenestra Salesman (listed in your Yellow Telephone Directory) . . . Representative of America's oldest and largest Steel Window Manufacturer.

7 SAVINGS WITH NEW FENESTRA WINDOWS

1. Butts integral with jamb weathering bars—stronger, fewer parts, lower maintenance.
2. Precision machining of window bars—windows and vents of exact, uniform sizes.
3. Automatic assembly of ventilators—vents fit properly and operate easily.
4. Extended jamb bars—vents always align perfectly.
5. Strong, tight weathering sections—continuous double contact all around vent opening.
6. Rigid, interlocking mullin joints—rugged construction for low maintenance.
7. Strong hardware attachment—prevents breakage, affords safer locking.

COMMERCIAL PROJECTED WINDOW

Popular for offices, commercial, recreational, etc. Projecting sash design resists driving rain, even in severe storms. Operating sash swings on a concealed pivot axis at each jamb. Sash corners are welded, shoulders ground smooth.

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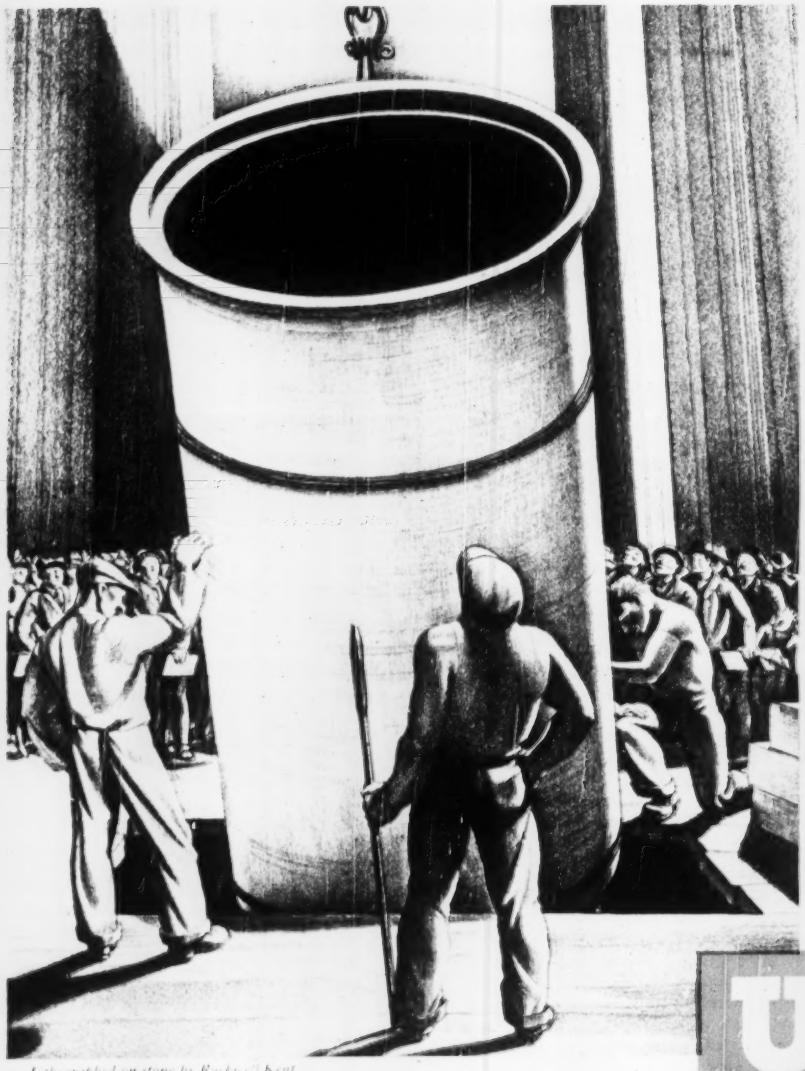
Name.....

Company.....

Address.....



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FOR WATER, GAS, SEWERAGE AND INDUSTRIAL SERVICE

"Meet the customers' needs" has been our watchword for more than fifty years. Whether it's pipe seven feet, or a few inches, in diameter—or a complicated fitting—or a special casting—we have the equipment and the technical skills to meet almost any need for cast iron pressure pipe and fittings. Taking advantage of process developments and utilizing scientific methods to control quality, our plants are regularly manufacturing products that adequately meet our customers' exacting requirements. **United States Pipe and Foundry Company, General Offices: Burlington, N. J. Plants and Sales Offices Throughout U. S. A.**

Continued from page 70

LOW BIDDERS

New Jersey ... $70,340

† New Jersey ... $45,835

† Texas ... $445,156 ... Approx. $700,000

CONTRACTS AWARDED

▲† California ... $1,031,790

† New York ... $606,520

Tex. Houston ... Approx. $40,000

AIRPORTS

BIDS ASKED

† Fla., Tampa ...

LOW BIDDERS

† O., Cleveland ... $425,330

FOREIGN

New South Wales, Sydney ...

PUBLIC BUILDINGS

BIDS ASKED

▲ Calif., Long Beach ...

† Wash., Richland ...

▲ Calif., Los Angeles ...

† N. J., North Arlington ...

▲ Pa., Somerset ...

▲ N. C., Raleigh ...

B. C., Port Alberni ...

LOW BIDDERS

Mass., Braintree ... $581,526

▲ N. Y., New York ... $1,406,900 ... $261,400

CONTRACTS AWARDED

Calif., Montecito ... $325,247

Calif., Riverside ... $388,799

N. Y., Naponoch ... $642,200

▲ N. Y., New York ... $2,588,000

▲ Pa., Phila. ... $1,683,894

† Tenn., Oak Ridge ... $181,987

W. Va., Parkersburg ... $250,000

▲ B. C., Trail ... $1,154,425

COMMERCIAL BUILDINGS

BIDS ASKED

R. I., Pawtucket ...

Que., Noranda ...

▲ Wash., Yakima ...

Miss., Worcester ...

Wis., Milwaukee ...

SOON LETS CONTRACT

Calif., Pasadena ...

Mass., Boston ...

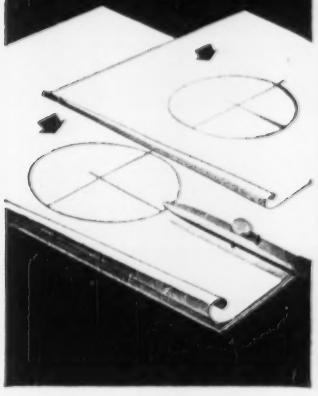
Mass., Millbury ...

N. J., Haddonfield ...

N. J., Trenton ...

4-24

Tracing cloth that defies time



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Imperial takes erasures readily, without damage. It gives sharp contrasting prints of even the finest lines. Drawings made on Imperial over fifty years ago are still as good as ever, neither brittle nor opaque.

If you like a duller surface, for clear, hard pencil lines, try Imperial Pencil Tracing Cloth. It is good for ink as well.

IMPERIAL TRACING CLOTH

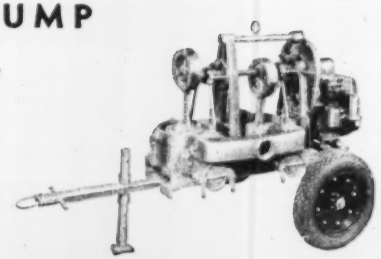
SOLD BY LEADING STATIONERY AND DRAWING MATERIAL DEALERS EVERYWHERE

NOVO QUALITY EQUIPMENT FOR FIFTY-NINE YEARS

A NEW PUMP

- DOUBLE DIAPHRAGM
- DOUBLE CAPACITY
- DOUBLE DUTY

Handles twice the amount of muddy, or sand and debris laden water as does Novo's well known single diaphragm model. Write or wire for specifications on this new pump.



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Mounts on 1½ Ton Truck

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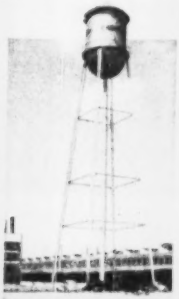

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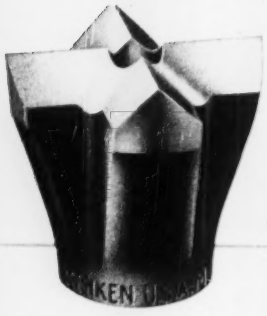

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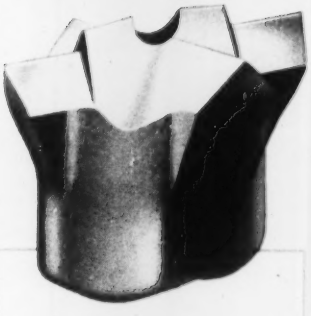
For drilling extremely hard and abrasive ground, small holes, extra deep holes. Drillers spend more time drilling—less time changing bits.



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Only TIMKEN® offers all 3 rock bit types...and a complete Rock Bit Engineering Service!

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Continued from page 74

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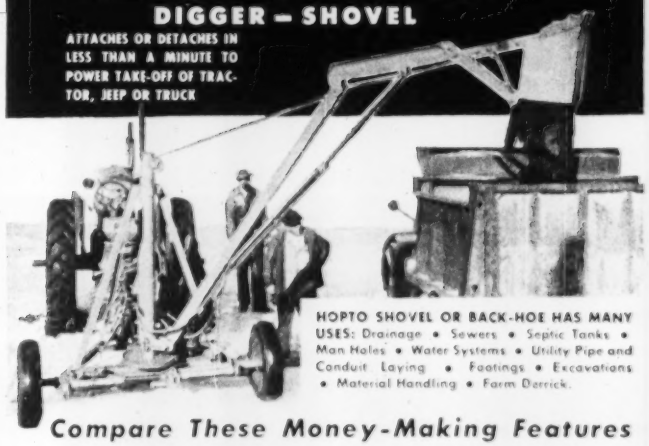
LOW PRICED, TRAILER-TYPE DIGGER HYDRAULICALLY OPERATED

ATTACHES OR DETACHES IN LESS THAN A MINUTE TO POWER TAKE-OFF OF TRACTOR, JEEP OR TRUCK



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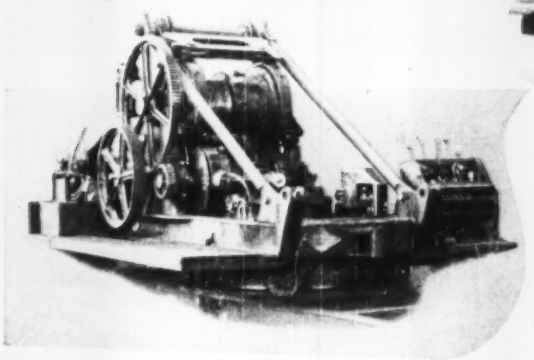
STREETS AND ROADS

(Continued on page 81)

Wheel Mounting now adds EXTRA CAPACITY and GREATER MOBILITY to LIMA Types 34 and 604



LIMA Type 604-M showing main machinery in position during assembly. Note hook roller construction and sturdy machinery base.

Illustrated above is the LIMA "Paymaster" (Type 34-M) mounted on wheels to provide the advantages of better mobility and extra capacity where ground conditions permit its application. Two sizes are now available with wheel mounting—the "Paymaster" and the LIMA Type 604. Wheel mounted "Paymaster" has shovel capacities of ¾ or 1 yd., and crane capacity of 20 tons. Type 604-M is a 35 ton crane. (Capacities rated with outriggers supported). Type 34-M is readily converted to crane, shovel, dragline or pull shovel. In these units one engine powers all operations, including travel, and one operator controls them all from his cab. LIMA wheel mounted machines are ideal for many material handling operations requiring constant movement around the job. They will save travel time and reduce cost of moving machine between scattered job sites—often justifying the use of equipment on even the smallest operation.

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Mud can't hurt the Gardner-Denver VP4 Pneumatic Sump Pump. Designed on a new principle of TOP-SUCTION—the VP4 can't "dig in"—won't bury itself in a muddy sump—won't block inlet flow.

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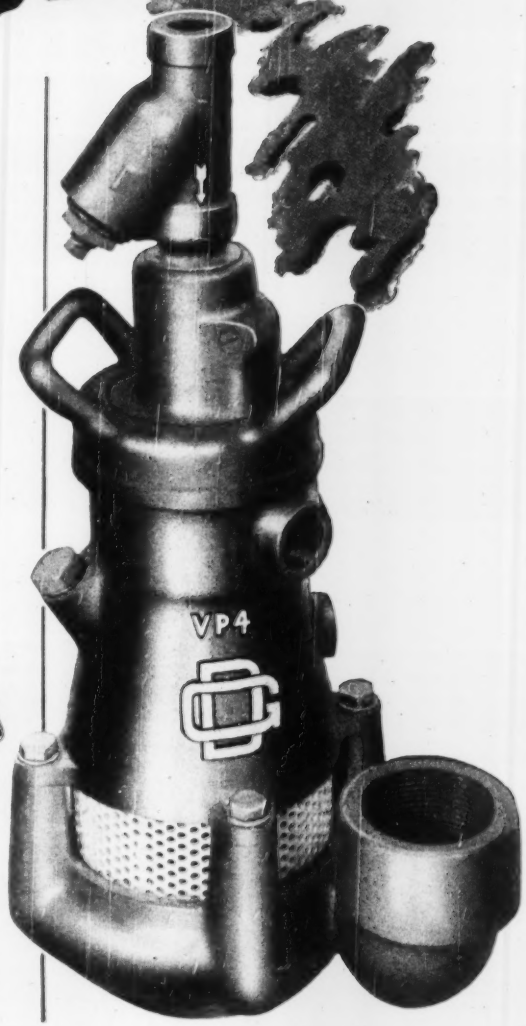

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(Continued from page 78)

$1,850,000. J. T. Comp, Hwy. Engr. Div., city owner. Murwyn B. Gerhauer, c. engr. in charge. CD 12-1-49.

▲ Tex., Edinburg—Drainage Dist., Edinburg, defeated bonds through county road. $1,500,000. Project abandoned. CD 3-3.

Tex., San Antonio—Fred W. Davis, c/o Guy D. French, 1210 Main St., Dallas, asph. street paving, concrete curbs and gutters, Brook Haven sub-division, $100,000. J. W. Beretta, Engineers, 902 Travis Bldg., consult. engrs.

Wash., Port Angeles—City, City Hall, $400,000 Bond election July 11. 24 in. R.C. conc. with asph. shoulders on Ennis, 1 st. Raymond, Ash, Race, Laurel to 1st, Caroline, Peabody, 8 to 10 Cherry, 2 to 3 and west on 2 to Marine Dr., Cedo from 8 to Marine Dr., Tennessee 5 to Marine Dr., Hemlock to Race, Sts., $500,000. H. Ahlers, city engr. CD 4-12.

Wash., Seattle—City, County City Bldg., Zone 4, grading, paving, 35 and 36 Aves. N. E., 1 st. to 70 and 75 Sts., $848,764. F. W. Kirke, city engr.

EARTHWORK, WATERWAYS

Pennsylvania—General State Auth., 18 and Herr Sts., Harrisburg, reconstruct old dam, Building access road and construct picnic shelters, bathhouse, fireplaces and similar outdoor recreational facilities at Bendigo Park, tax Co., $140,000. construct dam on Big Chickies Creek at White Oak for creation of recreational lake, Lancaster Co., $140,000. A. F. Jones, engineer-in-charge.

Alaska, Ketchikan—City, City Hall, retaining wall, $200,000. L. D. Hubbard, city engr.

AIRPORTS

▲ N. J., Newark—RUNWAY—Port of New York Auth., 111 8 Ave., New York, 11, N. Y. ■ grading, drainage & 200 ft. runway at Newark Airport, $1,171,930. CD 4-6-50.

‡ Wis., Milwaukee—HANGAR—National Guard Bureau, Camp Douglas, two wings 1 story, 114,000 sq. ft. each, steel frame addition at General Mitchell Field, in Lake, $350,000. Barth, Bogner & Associates, 759 N. Milwaukee St., Zone 2, archts. and engrs. CD 11-29-49.

LATIN AMERICA

Mexico—National Railways of Mexico, Bolivar 19, Mexico, D.F., plans extensive improvements of 2 railroads. The Pan American and Strings of Tehuantepec at Vera Cruz, Oaxaca, Chiapas, $1,380,000.

Mexico, Guadalajara—Municipal Govt., Palacio Municipal, Guadalajara, plans interurban bus and truck terminal, $300,000.

PUBLIC BUILDINGS

Calif., Duarte—SCHOOLS—Duarte School Dist., 1137 Central Ave., North East School, $368,973. school, 12 classroom auditorium, cafeteria, $448,514.

Calif., Orange—High school, orange school dist., Orange, voted $730,000 bonds, plans for unit.

Calif., Santa Paula—SCHOOL FACILITIES—Santa Paula Elementary School Dist., Santa Paula, voted $500,000 bonds, school facilities. CD 4-24.

Conn., Meriden—HOUSING—City of, Meriden Housing Auth., to Gale Terrace, plans by Wm. H. MacKay, 30 Colony St., and Stirling & Goldbecker, 205 Temple St., New Haven, 70 frame family units, $650,000.

Conn., North Grosvenor Dale—SCHOOLS—Town Bd. Selectmen, Town Hall, plans by Warmenhoven & Alvord, 36 Pearl St., Hartford, 2 story, Elmtt., brick, steel school, $425,000.

Del., Wilmington—SCHOOLS—Bd. Educ., 11 and Washington Sts., plans by George E. Pyle & Albert Kahn, 11 W. Washington St., for school, 13, $650,000.

La., Tallulah—SCHOOLS—Madison Parish, Tallulah voted $400,000 bonds, May 9, school improv., $600,000. CD 4-28.

▲ Mass., Holden—SCHOOL—Town of, Holden, Rutland, Prelim. planning and Perkins plans by Forrest W. Brookes, 111 Main St., Worcester, 2 story, brick, concrete, regional high school, $1,500,000.

Mass., Hudson—SCHOOL—Town, Bd. Selectmen, Town Hall, plans by Clark & Arnold, Architects, 32 2 Main St., Worcester, 4 story, steel, brick, for school, $750,000. Rand, Kingsbury & Jones, 340 Main St., Worcester, school architects.

N. J., Keyport—SCHOOL—Bd. Educ., $400,000 bond election, 2 high school units.

N. J., Newark—CAFETERIA—Bd. Educ., 31 Green St., cafeteria, gymnasium and auditorium at East Side High School, $750,000. CD 2-21-47.

N. Y., Summit—SCHOOL—Union Free School Dist., Woodlawn Ave., $800,000. incl. equip. CD 4-13-50.

▲ N. Y., Huntington—SCHOOL—Union Free School Dist., Huntington, 2 school, Park Ave., $1,100,000.

O., Columbus—HEALTH AND SAFETY CENTER—City, C. P. Bolton, city health and safety center Bldg., Comm., City Hall, plans by Dan A. Confer, 4 E.

ATLANTIC Pneumatic TOOLS

Use with your standard power pavement equipment . . . .

THE ATLANTIC PNEUMATIC ROCK BREAKER

Splits Large Rocks and Boulders quickly
No Plugs and Feathers — No Explosives
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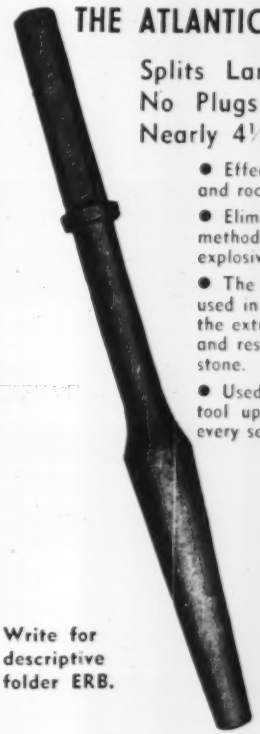

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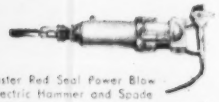

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Long St. and Sims, Cornelius & Schooley, 2901 N. Main St., health and safety center, Washington Blvd. between Town and Belle Isle, $400,000. CD 1-31-46.

O Westerville, Schools, Bd. Educ., Westerville, Franklin Co., Warner St. southeast sect., $450,000.

▲ Ore., Baker, Cath. Archdiocese, Dist. R. City Hall, Fed. Bldg., $1,858,000. Freeman, Hering & Tate, 2260 W. 11th St., Portland. CD 1-2.

Pa., East Pittsburgh, High Schools, School Dist. North Versailles Twp., East Pittsburgh, plans by Wagner Schmidt, 6101 Penn Ave., Pittsburgh, 1- and 2-story, about 270 x 344 ft., brick on concrete, Junior High School, Park Terrace, North Versailles Twp., $850,000.

▲ Pa., Ireland, High Schools, Warrington School Dist., James G. Warner, prog., Ireland high school, $2,000,000.

▲ Pa., Phila., PSYCHIATRIC INSTITUTE, Pennsylvania General State Authy., 18 and Haverford Sts., Harrison & Abramovitz & Abbe, archts., Ballinger & Perkins, mech. engrs., Psychiatric Institute Administration and Nurses Residence, Research Bldg., combination nurses home and physicians residence, new plant, laundry, service bldg., $7,200,000. Harry Sternfeld, 1411 Walnut St., assoc. archt. A. F. Jones & Co., gen. contr., CD 5-9.

Pa., Phila., SCHOOLS, Bd. Educ., 21st and Jefferson Sts., plans by Harry Sternfeld, 1411 Walnut St., Germantown High School alterations, $300,000. plans by Ambrose & Ester, 117 S. 17 St., Frankford High School alterations, $300,000. CD 12-14-46.

▲ Pa., State College, BUILDINGS, Pennsylvania General State Authy., 18 and Haverford Sts., Philadelphia, plans by Zantzinger, Borie & Medary, Packard Bldg., Philadelphia, Lab., Laboratory, Penn. State College, $758,000. plans by Jack S. Steele & Sons, 1417 Cherry St., Philadelphia, Barracks Hall, $962,000. plans by Trautwein & Howard, 1411 Walnut St., Phila., physical education addn., $1,108,000. plans by Kling & Swartzmiller, 121 Washington Rd., Pittsburgh, library addn., $1,408,000. plans by Altenhof & Boam, 210 Grant St., Pittsburgh, mechanical engr. bldg., 2 wings, addn., $1,362,000. Trautwein & Howard, 1411 Walnut St., Phila., supervising archts., CD 12-23.

▲ Tex., Dallas, STREETS, etc., City, City Hall, Main and Harwood Sts., bond election June 20, municipal auditorium, storage and mechanical room addn., $1,300,000; addn. public market, $1,500,000. J. E. Conrad, City Hall, Plan. Engr. Sec. Eng. for Municipal Service, City Hall, city plan engr., CD 4-14.

▲ Tex., Dallas, SCHOOLS, Dallas Independent School Dist., Ervay and Floyd Sts., plans by Mark Lemmon, 1210 Main St., vocational and technical school addition to Austin Senior High School, $2,500,000. vocational and technical school for Booker T. Washington High School area, $1,250,000. CD 4-23.

Tex., Henderson, HOUSING, Henderson Housing Authy., 7 N. McCarty, chn., Henderson, plans by Donald Nelson & Sumner Palace Theatre Bldg., Fort Worth, surveyors, Bentley, Broad & Nelson, Post Bldg., Dallas, and J. E. Downing, Henderson, 500 housing units, $500,000-$600,000. CD 4-19.

Tex., Lubbock, DORMITORY, Texas State Teachers College, Archie plans by Harvey P. Smith, Natl. Bank Commerce Bldg., 306 Antonio, dormitory for 300 girls, $450,000.

Tex., Raymondville, SCHOOLS, Raymondville Independent School Dist., Raymondville, Senior High school, $450,000; Junior High School, $550,000. CD 6-24-47.

Wis., Antigo, HOSPITAL, Langlade County Memorial Hospital, Antigo, plans by Eschweiler & Eschweiler, Architects, Bldg., 500 Pine St., Green Bay, 1-story, 50 bed addn., $551,350.

Wis., Milwaukee, APARTMENTS, Milwaukee Housing Authy., 1- and 2-story, 100 units, $400,000. John Messmer, Architect, CD 10-19-49.

▲ Alaska, Anchorage, HOSPITALS, Alaska Territorial Authy., $3,000,000.

Alaska, Fairbanks, SCHOOLS, Fairbanks Independent School Dist., $750,000.

Alaska, Juneau, SCHOOLS, Juneau Independent School Dist., $750,000.

▲ Ont., Hamilton, HOSPITALS, [illegible], $2,750,000.

Ont., Ottawa, HOSPITALS, [illegible], $500,000.

Que., Louisville, HOSPITALS, [illegible], $600,000.

▲ Sask., Regina, PLANT, [illegible], $1,500,000.

COMMERCIAL BUILDINGS

▲ Calif., Hillsborough, [illegible], $1,000,000.

▲ Conn., Derby, [illegible], $2,500,000.

▲ Conn., New Haven, [illegible], $1,200,000.

Continued on page 85

Installing Bethlehem Safety-Beam Guard Rail and Bethlehem Steel Posts on Route 116, near Hinesburg, Vermont. Guard Rail Erector: Costantino Brothers, Inc., Providence, R. I.

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Use Safety-Beam Guard Rail

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Safety-Beam Guard Rail is ideal for use at danger points because of its strength and ability to absorb impact. The rail consists of heavy sections of steel plates, bolted together to form a continuous, impact-absorbing beam. When a runaway vehicle strikes Safety-Beam, impact is absorbed not by one post but by several, making it next to impossible to crash through the rail. In practically every case, the vehicle is directed parallel to the rail.

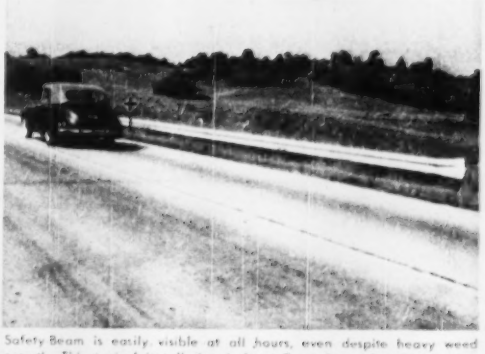
Safety-Beam Guard Rail is easily visible, both day and night. It can be installed quickly, even by unskilled labor, for it fastens to the post with one bolt. Can be used with either steel or wood posts. No end anchor rods, special tools or complicated adjustments are required. Safety-Beam is regularly furnished in 12 ft. 6 in. lengths, but can also be obtained in longer lengths.

Our Folder 545 gives detailed information about Safety-Beam Guard Rail. Ask the nearest Bethlehem sales office for a copy, or write to us at Bethlehem, Pa.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

Safety-Beam Guard Rail protects cars from damage on this unique course for new drivers, which is operated at Harrisburg, Pa., by Pennsylvania State Police. Guard Rail Erector: L. S. Lee & Son, Harrisburg.



Safety-Beam is easily visible at all hours, even despite heavy weed growth. This typical installation is located on Route 8, near Canton, Ohio. Contractor: Lewis and Frisinger Co., Ann Arbor, Michigan.

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America's most cost-conscious, profit-minded truck users have preferred Internationals year after year for only one reason: heavy-duty engineering means that International Truck performance is longer life performance, lower operating and maintenance cost performance.

And now the same management, engineers, test experts, and production men who kept Internationals a tradition in the heavy-duty truck field have developed *every new International Truck*. No matter what size truck you use, there's a heavy-duty engineered International Truck that's right and ready for you!

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Model for model, here is "the roomiest cab on the road." It gives you new comfort in easy-riding cushions, adjustable seats, controlled ventilation. It gives you full front visibility through a one-piece, scientifically curved Sweepsight windshield.

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INTERNATIONAL TRUCKS

INTERNATIONAL HARVESTER COMPANY CHICAGO

(Continued from page 82)

center, $5,000,000; ... $2,325,000; ... $650,000; ... $325,000; ... $1,000,000; ... $500,000; ... $600,000; ... $1,000,000; ... $400,000; ... $6,000,000; ... $750,000; ... $2,500,000; ... $676,000; ... $500,000; ... $1,000,000; ... $750,000; ... $1,622,000; ... $1,775,000; ... $1,890,000; ... $3,209,010; ... $452,000; ... $6,000,000; ... $450,000; ... $3,000,000; ... $500,000; ... $400,000; ... $100,000; ... $700,000; ... $400,000; ... $500,000; ... $2,300,000; ... $503,000

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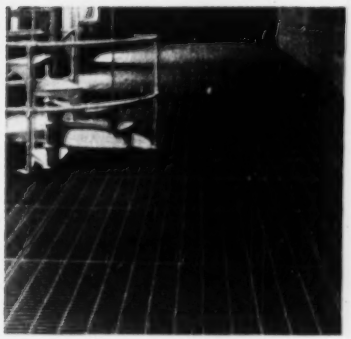

you secure these outstanding advantages: 90% open area for light and ventilation . . . square-edge, uniformly spaced steel bars that provide a non-slipping, level walking surface . . . pressure-formed Mitco construction that obviates weaknesses of bolts, rivets and angle irons—eliminates dirt-catching and light-obstructing projections . . . ample strength to support heavy loads without any lateral deflection of flooring. Write for Hendrick Mitco Products catalogue.

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Tex. Austin—DORMITORY, etc.—Huston-Tillotson College, 1820 E. 8th St.; plans by Giesecke, Koenig & Brooks, 1214 E. 8th St.; masonry men's dormitory, $250,000; masonry women's dormitory, $250,000; masonry administration, $250,000; auditorium, Approx. $250,000.

Tex. Fort Worth—DORMITORY—Texas Christian University, Fort Worth; plans by Preston M. Geren, 306 N. 7th St., Abilene; boys dormitory, $400,000.

▲ Tex. Houston—HOMES, etc.—Keeter, 2400 Pease St.; plans by R. W. Hoffner & Assoc., 2141 Times Bldg.; 100 homes, area bounded by Memorial Dr., Memorial Loop, Gessner Rd. and Memorial Dr. area west of Post Oak Rd., $4,000,000.

Tex. Houston—RESIDENCES—C. W. Hickman, 7306 Lindell St.; 4-rm frame residence, concrete slab foundation, Wenley Pl. and Jay St., $475,000.

▲ Tex. Houston—DWELLINGS—DeWitt D. Krant, 3801 N. MacGregor St.; plans by Dunaway & Jones, 4414 Montrose Blvd.; 75 frame masonry-trimmed dwellings, concrete slab foundations, Elysian, Libby, Heath Sts., $675,000; 35 frame brick duplexes, concrete slab foundations, part of Saxon and Donnelly Sts., $540,000.

Tex. Houston—RESIDENCES—Martin Nadelman, 5305 Braithwood St.; plans by Jack Knotsman & James F. Webster, 2012 W. Gray St.; eighty 2- and 4-story residences, concrete slab foundations, Florinda, Daphney and Alberta Sts., $800,000.

▲ Tex. Houston—DWELLINGS—Plantation Development Corp., 4040 Holmes Rd.; plans by Perry Johnston, 2406 Main St.; 507 dwellings, new sect. of South Park subdivision, $3,500,000.

Tex. Midland—OFFICE—Jack B. Wilkerson, Petroleum Bldg.; 1-story, humid. brick, steel & concrete joist and beam trim, Big Spring St., $500,000.

W. Va. Morgantown—CHURCH—First Presbyterian Church, High St. church, $300,000.

▲ Alta. Edmonton—MERCHANDISING—D. B. Landers & Assoc. and F. H. MacDonald, 220 Kresge Bldg., 6-story, reinf.-con. merchandising bldg., $1,250,000.

▲ N. S. Sydney—HOSPITAL—St. Rita's Hospital, Sisters of St. Martha, Kings Rd.; plans by Govan, Ferguson, Lindsay, Kantzler, Mow, Langley & Keenleyside, 515 Jarvis St., Toronto; 1-yr., 125 bed hospital addn., Approx. $1,200,000.

INDUSTRIAL BUILDINGS

Ala. Birmingham—GARAGE—Dixie Drive-It Yourself System, c/o John W. Black Jr., 1416 S. Ave. N.; 5-sto. storage garage, $300,000.

Del. Lewes—PLANT—Consolidated Fisheries Co., Lewes; fish processing and reclaiming plant addn., $400,000.

A. R. Isaf, 1st. owner engr.

▲ Ind. Kokomo—MILL—Continental Steel Co., 1100 S. Market St.; steel rolling mill, $5,000,000.

Kenyon W. Moreland, Ave., $5,000,000, CD

▲ Kan. Kansas City—PLANT—Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago, Ill.; rein. con. brick, steel, scale mfg. plant on 40 acre tract adjacent to Santa Fe R. R. Yards at Turner, $5,000,000.

▲ Ky. Shively—GRAIN ELEVATORS and WAREHOUSE—Cumberland Tri-City Grain Co., 2412 S. Floyd St., Louisville; grain elevators and warehouse, $1,000,000.

Duncan Engr. Co., 188 W. Randolph St., Chicago, Ill., engr.

▲ N. Y. Astoria—GENERATING PLANT—Consolidated Edison Co. of New York, 4 Irving Pl., New York; 2nd unit, steam electric generating plant near present plant, $25,000,000.

O. Cleveland—Trinity Memorial Cemetery, c/o Trinity Cathedral, 2081 Euclid Ave.; plans by [illegible] Cleveland; mausoleum, $350,000.

▲ Pa. Pittsburgh—PLANT—New Kensington, Inc., New Kensington; plant addn., $1,000,000.

▲ S. C. Charleston—PLANT—Owens-Illinois Glass Co., 6 Ann St., Toledo, O.; glass container plant addn., $5,475,000.

▲ Tex. Dallas—PLANT—United States Rubber Co., 1230 Main St., New York; tire mfg. plant, $1,000,000.

Tex. Fort Worth—[illegible] $250,000.

Wash. [illegible] $40,000.

Wis. Milwaukee—[illegible] $200,000.

Alta. Grande Prairie—[illegible] $100,000.

N. S. New Glasgow—[illegible] $125,000.

UNCLASSIFIED

Calif. San Bruno—SWIMMING POOL—City, City Hall, [illegible] $230,000.

Idaho—RURAL DISTRIBUTION LINES—Lost River Electric Co-operative, Market, 31 mi. rural distr. line, 12 mi. 44-kv transmission line and sub. improv., Butte Co., $633,000.

Idaho—RURAL DISTRIBUTION LINES—Salmon River Electric Co-operative, Challis, 261 mi. rural distr. lines, 52 mi. transmission line and sub. improv., $415,000.

Kansas—RURAL DISTRIBUTION LINES—Flint Hills Rural Electric Co-operative Assoc., Council Grove, 54 mi. rural distr. lines, and sub. improv., Morris Co., $349,000.

Kansas—RURAL DISTRIBUTION LINES—N.C.K. Electric Co-operative, Herkimer, 227.25 mi. rural distr. lines, two-way radio, sub-station, 16 lines, sub. improv., Doniphan, Brown and Atchison Counties, $411,000. Raymond H. Reed & Co., Columbus, Neb., consult. engrs.

Kansas—RURAL DISTRIBUTION LINES—Victory Electric Co-operative Assoc., Dodge City, 179 mi. rural distr. lines, improv., Ford Co., $250,000.

▲ La. Natchitoches—NATURAL GAS SYSTEM—City of Natchitoches, Sept. 5 bond election, June 20, $1,200,000.

Miss. Baldwyn—NATURAL GAS SYSTEM—Town, Tues. Hd. voted bonds, May 15, natural gas sys., $280,000.

Miss. Booneville—NATURAL GAS SYSTEM—Town, Tues. Hd. voted bonds, May 15, natural gas sys., $675,000. CD 4-25.

Neb. Lincoln—DRIVE-IN THEATER, M. B. Lundy, 58 and D Sts., and Horton Kar-Vu drive-in theater, 56 and O Sts., both outside of city, $125,000.

New Mexico—RURAL DISTRIBUTION LINES—Northern Rio Arriba Electric Co-operative, Chama, 20 mi. 69 kv rural distr. line and 1,500 kva sub-station, $100,000. 177 mi. 14.4-24.9 kv rural distr. lines, $225,000, both R.D. Arriba Co.; Southwest Engineers, 510 Tingley Tower, San Antonio, Tex., consult. engrs., CD 4-25.

N. J. Atlantic City—COMFORT STATION, Atlantic City Bd. Comm.; plans by Rosenstein & Thom, Guarantee Title & Trust Bldg., Atlantic City; comfort station, New York Ave., $150,000.

North Carolina—RURAL DISTRIBUTION LINES—Lumbee River Electric Membership Corp., Red Springs, 1,000 mi. rural distr. lines, Robeson Co., $450,000.

North Carolina—RURAL DISTRIBUTION LINES—Randolph Electric Membership Corp., Asheboro, 115 mi. rural distr. lines, Randolph Co., $315,000. R. D. Lambert Engineers, Inc., 700 Jefferson Standard Bldg., Greensboro, consult. engrs., CD 4-25-50.

▲ Oklahoma—RURAL DISTRIBUTION LINES—Cookson Hills Electric Co-operative, Vian, 19.29 mi. and 69 kv. transmission line, 4.25 mi. rural distr. lines and substation, and 1,000 mi. rural distr. lines, Haskell Co., $1,000,000.

Okla. Oklahoma City—BOWLING ALLEY, etc.—R. L. Hartley, 2 W. 29 St.; combination bowling alley, billiard parlor and restaurant on 200 block of S. W. 29 St., $275,000.

Pennsylvania—RECREATIONAL LAKE—General State Auth., 3 mi. east of Harrisburg; dam for forebay and pumped storage lake in Lake Wm. Penn Park, $130,000. W. Linn Sisler Jr., Hill Bldg., Reading, consult. engr. A-E plans to be taken by engr.

Pa. Lehighton—PARK AND STADIUM—Lehighton Borough; plans by Fridy, Dahlem, Truscott & Fridy, Allentown; park and stadium, $300,000.

South Dakota—RURAL DISTRIBUTION LINES—Moreau-Grand Electric Co-operative, Timber Lake, 1,000 mi. rural distr. lines, $155,000.

South Dakota—RURAL DISTRIBUTION LINES—Lower Brule Sioux Tribe, Fort Thompson, 233 mi. rural distr. lines, $233,000.

South Dakota—RURAL DISTRIBUTION LINES—West River Electric Assn., Wall, 1,111 mi. rural distr. lines, Pennington, Jackson, Haakon, Jones, Mellette, Todd, Tripp, Gregory and Lyman Counties, $193,000.

▲ Texas, Oklahoma and Kansas—GAS PIPE LINE—Natural Gas Pipeline Co. of America, 122 S. Michigan Ave., Chicago, Ill.; 30 in. pipe line, 645,000 ft. of 26 in. pipe line, 58,645,000 ft. of 24 in. pipe line, 58,645,000 ft. of 20 in. pipe line, 58,645,000 ft. of 16 in. pipe line, 58,645,000 ft. of 12 in. pipe line, 58,645,000 ft. of 10 in. pipe line, 58,645,000 ft. of 8 in. pipe line, 58,645,000 ft. of 6 in. pipe line, 58,645,000 ft. of 4 in. pipe line, 58,645,000 ft. of 3 in. pipe line, 58,645,000 ft. of 2 in. pipe line, 58,645,000 ft. of 1 in. pipe line, 58,645,000 ft. of 0.5 in. pipe line, 58,645,000 ft. of 0.25 in. pipe line, 58,645,000 ft. of 0.125 in. pipe line, 58,645,000 ft. of 0.0625 in. pipe line, 58,645,000 ft. of 0.03125 in. pipe line, 58,645,000 ft. of 0.015625 in. pipe line, 58,645,000 ft. of 0.0078125 in. pipe line, 58,645,000 ft. of 0.00390625 in. pipe line, 58,645,000 ft. of 0.001953125 in. pipe line, 58,645,000 ft. of 0.0009765625 in. pipe line, 58,645,000 ft. of 0.00048828125 in. pipe line, 58,645,000 ft. of 0.000244140625 in. pipe line, 58,645,000 ft. of 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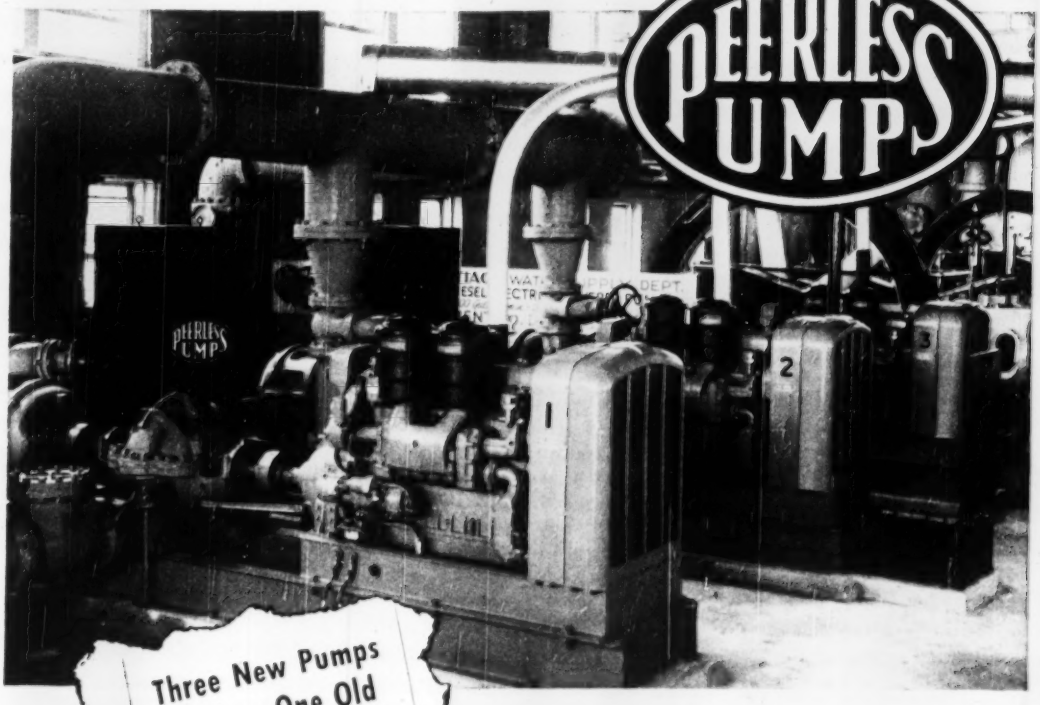
0.000000000000000000000000000000024651903288156618919116517665087069677287701097157201729714870452880859375 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000000000000123259516440783094595582588325435348386438505485786008648574352264404296875 in. pipe line, 58,645,000 ft. of 0.00000000000000000000000000000000616297582203915472977912941627176741932192527428930043242871761322021484375 in. pipe line, 58,645,000 ft. of 0.000000000000000000000000000000003081487911019577364889564708135883709660962637144650216214358806610107421875 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000000000000154074395550978868244478235406794185483048131857232510810717940330505371093750 in. pipe line, 58,645,000 ft. of 0.00000000000000000000000000000000770371977754894341222391177033970927415240659286162554053589701652526855468750 in. pipe line, 58,645,000 ft. of 0.000000000000000000000000000000003851859888774471706111955885169854637076203296430812770267948508262634277343750 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000000000000192592994438723585305597794258492731853810164821540638513397425413131713867187500 in. pipe line, 58,645,000 ft. of 0.00000000000000000000000000000000962964972193617926527988971292463659269050824107703192566987127065658569335937500 in. pipe line, 58,645,000 ft. of 0.000000000000000000000000000000004814824860968089632639944856462318296345254120538515962834935635328292846679687500 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000000000000240741243048404481631997242823115914817262706026925798141746781766414642333984375000 in. pipe line, 58,645,000 ft. of 0.00000000000000000000000000000001203706215242022408159986214115579574086313530134628990708733908832073211669921875000 in. pipe line, 58,645,000 ft. of 0.000000000000000000000000000000006018531076210112040799931070577897870431567650673144954853669544160366058349609375000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000000000000300926553810505602039996553528894893521578382533657247742683477208018302917480468750000 in. pipe line, 58,645,000 ft. of 0.00000000000000000000000000000001504632769052528010199982764644474467607891912668286238713417386040091514587402343750000 in. pipe line, 58,645,000 ft. of 0.000000000000000000000000000000007523163845262640050999913823222372338039459563341431193567086930200457572937011718750000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000000000000376158192263132002549995691161118616901972978167071559678354346510022878646850585937500000 in. pipe line, 58,645,000 ft. of 0.00000000000000000000000000000001880790961315660012749978455805593084509864890835357798391771732550114393234252929687500000 in. pipe line, 58,645,000 ft. of 0.000000000000000000000000000000009403954806578300063749892279027965422549324454176788991958858662750571966171264648437500000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000000000000470197740328915003187494613951398271127466222708839449597942933137528598308563232421875000 in. pipe line, 58,645,000 ft. of 0.00000000000000000000000000000002350988701644575015937473069756991355637331113544197247989714665687642991542816162109375000 in. pipe line, 58,645,000 ft. of 0.000000000000000000000000000000011754943508222875079687365348784956778186655567720986239948573328438214957714080810546875000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000000000000587747175411143753984368267439247838909332778386049311997428666421910747885704040527343750000 in. pipe line, 58,645,000 ft. of 0.00000000000000000000000000000002938735877055718769921841337196239194546663891930246559987143332109553739428520202636718750000 in. pipe line, 58,645,000 ft. of 0.000000000000000000000000000000014693679385278593849609206685981195972733319459651232799935716660547768697142601013183593750000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000000000000734683969263929692480460334299059798636665972982561639996785833027388434857130050659179687500000 in. pipe line, 58,645,000 ft. of 0.00000000000000000000000000000003673419846319648462402301671495298993183329864912808199983929165136942174285650253295898437500000 in. pipe line, 58,645,000 ft. of 0.000000000000000000000000000000018367099231598242312011508357476494965916649324564040999919645825684710871428251266479492187500000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000000000000918354961579912115600575417873824748295832466228202049999598229128423554357141256332397460937500000 in. pipe line, 58,645,000 ft. of 0.00000000000000000000000000000004591774807899560578002877089369123741479162331141010249997991145642117771785706281661987304687500000 in. pipe line, 58,645,000 ft. of 0.000000000000000000000000000000022958874039497802890014385446845618707395811655705051249989955728210588858928531408309936523437500000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000000000000114794370197489014450071927234228093537479058278525255249949778641052944294642657041549682617187500000 in. pipe line, 58,645,000 ft. of 0.00000000000000000000000000000000573971850987445072250359636171140467687395291392626276249748893205264721473213285207748413085937500000 in. pipe line, 58,645,000 ft. of 0.000000000000000000000000000000002869859254937225361251798180855702338436976456963131381248744466026323607366066426038742065429687500000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000000000000014349296274686126806258990904278511692184882284815656906243722330131618036830332130193710327148437500000 in. pipe line, 58,645,000 ft. of 0.00000000000000000000000000000000717464813734306340312949545213925584609244114240782845312186116506580901841516606509685516357421875000 in. pipe line, 58,645,000 ft. of 0.000000000000000000000000000000003587324068671531701564747726069627923046220571203914226560930582532904509207583032548427581787109375000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000000000000017936620343357658507823738630348139615231102856019571132804652912662522546037915162742137908935546875000 in. pipe line, 58,645,000 ft. of 0.00000000000000000000000000000000896831017167882925391186931517406980761555142800978556640232645633126127301895758137106895446777343750000 in. pipe line, 58,645,000 ft. of 0.000000000000000000000000000000004484155085839414626955934657587034903807775714004892783201163228165630636509478790685534477233886718750000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000000000000022420775429197073134779673287935174519038878570020446416005816140828153182547393953427672386169433593750000 in. pipe line, 58,645,000 ft. of 0.00000000000000000000000000000000112103877145985365673898366439675872595194392850102232080029080704140765912736969713836193084716796875000 in. pipe line, 58,645,000 ft. of 0.000000000000000000000000000000000560519385729926828369491832198379362975971964250511160400145403520700382956368484856918096542358398437500000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000000000000002802596928649634141847459160991896814879859821255580200727017603503501914781842424594802712917041015625000000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000000000000014012984643248170709237295804959484074399299106277901003635088017517509573909212122974013564585205078125000000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000000000000070064923216240853546186479024797420371996495531389505018175440087587547869546060614870067822926025390625000000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000000000000350324616081204267730932395123987101859982477656947525090877200437937739347730303074350339114630126953125000000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000000000001751623080406021338654661975619935509299912388284737625454386002189688696738651515371751695573150634765625000000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000000000008758115402030106693273309878099677546499561941423688127271930010948443483693257576858758477865753173828125000000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000000000043790577010150533466366549390498387732497809707118440636359650054742217418466287884293792389328765869140625000000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000000000218952885050752667331832746952491938662489048535592203181798250273711087092331439421468961946643829345703125000000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000000001094764425253763336659163734762459693312445242677961015908991251368555435461657197107344809733219146728515625000000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000000005473822126268816683295818673812298466562226213389805079544956256842777177308285985536724048666095733642578125000000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000000027369110631344083416479093369061492332811131066949025397724781284213885886541429927683620243330478668212890625000000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000000136845553156720417082395466845307461664055655334745126988623906421069429432707149638418101216652393341064453125000000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000000684227765783602085411977334226537308320278276673725634943119532105347147163535748192090506083261966705322265625000000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000003421138828918010427059886671132686541601391383368628174715597660526735735817678740960452530416309833526611328125000000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000017105694144590052135299433355663432708006956916843140873577988302633678679088393704802262652081549167633056640625000000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000085528470722950260676497166778317163540034784584215704367889941513168393395441968524011313260407745838165283203125000000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000000427642353614751303382485833891585817700173922921078521839449707565841966977209842620056566302038729190826416015625000000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000002138211768073756516912429169457929088500869614605392609197248537829209834886049213100282831519364595413208007812500000000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000010691058840368782584562145847289645442504348073026963045986242689146049174430246065501414157596822977066040039062500000000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000053455294201843912922810729236448227212521740365134815229931213445730245872151230327507070787984114885330200195312500000000 in. pipe line, 58,645,000 ft. of 0.0000000000000000000267276471009219564614053646182241136062608701825674076149656067228651229360756151637535353939920574426651000976562500000000 in. pipe line, 58,645,000 ft. of 0.0000000000000000001336382355046097823070268230911205680313043509128370380748280336143256146803780758187676969960287213325500488281250000000 in. pipe line, 58,645,000 ft. of 0.0000000000000000006681911775230489115351341154556028401565217545641851903741401680716280734018903790938384849801436066627502441406250000000 in. pipe line, 58,645,000 ft. of 0.0000000000000000033409558876152445576756705772780142007826087728209259518707008403581403670094518954691924249007180333137512207031250000000 in. pipe line, 58,645,000 ft. of 0.0000000000000000167047794380762227883783528863900710039130438641046297593535042017907018350472594773459621245035901665687561035156250000000 in. pipe line, 58,645,000 ft. of 0.0000000000000000835238971903811139418917644319503550195652193205231487967675210089535091752362973867298106225179508328437805175781250000000 in. pipe line, 58,645,000 ft. of 0.0000000000000004176194859519055697094588221597517750978260966026157439838376050447675458761814869336490531125897541642189025878906250000000 in. pipe line, 58,645,000 ft. of 0.0000000000000020880974297595278485472941107987588754891304830130787199191880252238377293809074346682452655629487708210945129394531250000000 in. pipe line, 58,645,000 ft. of 0.0000000000000104404871487976392427364705539937943774456524150653935995959401261191886469045371733412263278147438541054725646972656250000000 in. pipe line, 58,645,000 ft. of 0.0000000000000522024357439881962136823527699689718872282620753269679979797006305959432345226858667061316390737192705273628234863281250000000 in. pipe line, 58,645,000 ft. of 0.0000000000002610121787199409810684117638498485944361413103766348399898985031529797161726134293330658195368596352636818141174316406250000000 in. pipe line, 58,645,000 ft. of 0.0000000000013050608935997049053420588192492429721807065518831741999494925157648985808630671466653290976842981763184090705871582031250000000 in. pipe line, 58,645,000 ft. of 0.0000000000065253044679985245267102940962462148609035327594158709997474625788244929043153357333266454884214908815920453529357910156250000000 in. pipe line, 58,645,000 ft. of 0.0000000000326265223399926226335514704812310743045176637970793549987373128941224645215766786666332724421074544079602267646789550781250000000 in. pipe line, 58,645,000 ft. of 0.0000000001631326116999631131677573524061553715225883189853967749936865644706123226078833933331663622105372720398011338233947753906250000000 in. pipe line, 58,645,000 ft. of 0.0000000008156630584998155658387867620307768576129415949269838749684328223530616130394169666658318110526863601990056691169738769531250000000 in. pipe line, 58,645,000 ft. of 0.0000000040783152924990778291939338101538842880647079746349193749421641117653080651970848333291590552634318009950283455848693847656250000000 in. pipe line, 58,645,000 ft. of 0.0000000203915764624953891459696690507694214403235398731745968747108205588265403259854241666457952763171590049751417279243469238281250000000 in. pipe line, 58,645,000 ft. of 0.0000001019578823124769457298483452538471072016176993658729843735541027941327016299271208332289763815857950248757086396217346191406250000000 in. pipe line, 58,645,000 ft. of 0.0000005097894115623847286492417262692355360080884968293649218677705139706635081496356041661448819079289751243785431981086730957031250000000 in. pipe line, 58,645,000 ft. of 0.0000025489470578119236432462086313461776800404424841468246093388525698533175407481780208307244095396448756218927159905433654785156250000000 in. pipe line, 58,645,000 ft. of 0.0000127447352890596182162310431567308884002022124207341230466942628492665877037408901041536220476982243781094635799527168273925781250000000 in. pipe line, 58,645,000 ft. of 0.0000637236764452980910811552157836544420010110621036706152334713142463329385187044505207681102384911218905473178997635841369628906250000000 in. pipe line, 58,645,000 ft. of 0.0000318618382226490455405776078918272210005055310518353076167356571231664692593522252603840551192455609452736589498817920684814453125000000 in. pipe line, 58,645,000 ft. of 0.0000159309191113245227702888039459136105002527655259176538083678285615832346296761126301920275596227804726368294749408960342407226562500000 in. pipe line, 58,645,000 ft. of 0.0000079654595556622613851444019729568052501263827629588269041839142807916173148380563150960137798113902363184147374704480171203613281250000000 in. pipe line, 58,645,000 ft. of 0.0000039827297778311306925722009864784026250631913814794134520919571403958086574190281575480068899056951181592073687352240085601806640625000000 in. pipe line, 58,645,000 ft. of 0.0000019913648889155653462861004932392013125315956907397067260459785701979043287095140787740034449528475590796036843676120042800903320312500000 in. pipe line, 58,645,000 ft. of 0.0000009956824444577826731430502466196006562657978453698533630229892850989521643547570393870017224764237795398018421838060021400451660156250000 in. pipe line, 58,645,000 ft. of 0.0000004978412222288913365715251233098003281328989226849266815114946425494760821773785196935008612382118897699009210919030010700225830078125000 in. pipe line, 58,645,000 ft. of 0.0000002489206111144456682857625616549001640664494613424633407557473212747380410886892598467504306191059448849504605459515005350112915039062500 in. pipe line, 58,645,000 ft. of 0.0000001244603055572228341428812808274500820332247306712316703778736606373690205443446299233752153095529724424752302729757502675056457519531250 in. pipe line, 58,645,000 ft. of 0.0000000622301527786114170714406404137250410166123653356158351889368303186845102721723149616876076547764862212376151364878751337528228759765625 in. pipe line, 58,645,000 ft. of 0.0000000311150763893057085357203202068625205083061826678079175944684151593422551360861574808438038273882431106188075682439375668764114379882812500 in. pipe line, 58,645,000 ft. of 0.0000000155575381946528542678601601034312602541530913339039587972342075796711275680430787404219019136941215553094037841219687834382057189941406250 in. pipe line, 58,645,000 ft. of 0.0000000077787690973264271339300800517156301270765456669519793986171037898355637840215393702109509568470607776547018920609843917191028594970703125 in. pipe line, 58,645,000 ft. of 0.0000000038893845486632135669650400258578150635382728334759896993085518949177818920107696851054754784235303888273509460304921958595514297485351562500 in. pipe line, 58,645,000 ft. of 0.0000000019446922743316067834825200129289075317691364167379948496542759474588909460053848425527377392117651944136754730152460979297757148742675781250 in. pipe line, 58,645,000 ft. of 0.0000000009723461371658033917412600064644537658845682083689974248271379737294454730026924212763688696058825972068377365076230489648878574371337890625 in. pipe line, 58,645,000 ft. of 0.0000000004861730685829016958706300032322268829422841041844987124135689868647227365013462106381844348029412986034188682538115244824439287185668945312500 in. pipe line, 58,645,000 ft. of 0.0000000002430865342914508479353150016161134414711420520922493562067844934323613682506731053190922174014706493017094341269057622412219643592834472656250 in. pipe line, 58,645,000 ft. of 0.0000000001215432671457254239676575008080567207355710260461246781033922467161806841253365526595461087007353246508547170634528811206109821796417236328125 in. pipe line, 58,645

DIESEL POWERED MUNICIPAL PUMPING STATION REPORTS PUMPING COSTS CUT 25%



Three New Pumps Replace One Old

The age of the damaged pump and high cost of repairs militated against any attempts to put it back in operation, and thus the decision was made to replace it with the three horizontal centrifugal pumps. The pumps selected were Peerless Pumps, characterized by the occurrence of normal operation in the 87% efficiency range. Normal operation, dictated by the top level of elevated storage, is at 67 pounds' pressure and 2,500 gpm.

Reprinted from American City Magazine, February, 1950

87% EFFICIENCY RANGE CHARACTERIZES PEERLESS PUMP INSTALLATION FOR EASTERN CITY

Municipalities point high efficiencies over extended pumping periods as only one reason for their acceptance of Peerless centrifugal pumps. Dependability, ease of maintenance, widest capacity range, quality construction set the Peerless standard for pump performance and operating economy. Look to Peerless for continued leadership in pumping water at measurable savings. Write today for Bulletin B-1300 describing and illustrating Peerless Type A horizontal pumps, shown installed in the photo above.

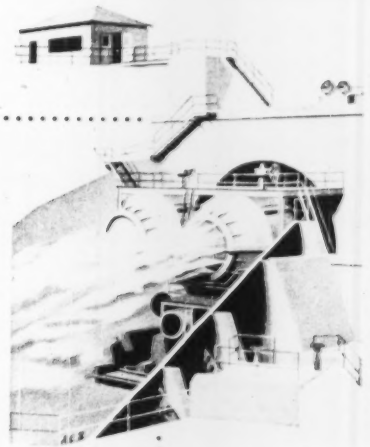
PEERLESS PUMP DIVISION

FOOD MACHINERY AND CHEMICAL CORPORATION

Factories: Los Angeles, California, and Indianapolis, Indiana
Offices: New York, Atlanta, Fresno, Los Angeles, Chicago, St. Louis, Phoenix, Dallas, Plainview and Lubbock, Texas.

ONE OF A SERIES DEMONSTRATING APPLIED LUKENOMICS

YARDSTICK FOR A FLOOD... or how to insure years of accurate Venturi-metering in giant penstocks

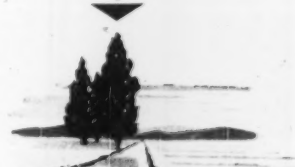


Accurate regulation of fast-flowing debris-laden water in San Gabriel Dam No. 1—world's greatest earth- and rock-filled structure—posed an important engineering problem. Four specially designed nickel-clad steel Venturi tubes were finally specified and installed. Designed for maximum discharge, these tubes have much higher throat velocities than ever before used and a differential pressure of about 22 feet of water between inlet and throat. Although tubes were of welded construction, riveted joints, with ¼" space between throats and inlets and outlets, were used in the tunnel sections to facilitate replacement, if required. Uniqueness of the installation required development of special flow measuring instruments using mercury. This Venturi design has been entirely satisfactory in over 13 years of operation giving consistent accuracy of metering with minimum maintenance.

Advances in structural design have resulted in increased efficiency . . . lower maintenance and operating costs . . . improved performance. Many improvements have been the result of close cooperation between designer, engineer, fabricator and materials supplier. We call this *Lukenomics*. Such an approach is at your disposal to help solve your cost and amortization problems along with other vital considerations.

To obtain the advantages of equipment built by fabricators applying the Lukenomics principle, write our Manager of Marketing Service, Lukens Steel Company, 513 Lukens Building, Coatesville, Pennsylvania.

San Gabriel Dam No. 1 was constructed by Los Angeles County Flood Control District. Lukens Nickel Clad Steel was selected for Venturi tubes because of the severe corrosive and erosive action of silt- and debris-laden flood waters.



LUKENS

LUKENS STEEL COMPANY

BETTER PRODUCTS FOR BETTER EQUIPMENT

MATERIALS AND LABOR PRICES

Market quotations on construction materials and wage rates reported monthly by ENR correspondents
July Materials and Labor Prices will appear in the July 6, 1950 issue

CEMENT, AGGREGATE, READY-MIXED CONCRETE—F. O. B. CITY

	PORTLAND CEMENT* Per bbl. C.L. lots incl. $1.00 per bbl. for bags, cash; disc. not deducted			SAND AND GRAVEL Per ton, carload lots			CRUSHED STONE Per ton, carload lots		CRUSHED SLAG Per ton, carload lots		CONCRETE BLOCK 8 x 8 x 16-in., truckload del., per block	CONCRETE Ready Mixed 1:2:4, over 50 c.y., del.
	Cloth	Paper	Bulk	Gravel 1½ in.	Gravel ¾ in.	Sand	1½ in.	¾ in.	1½ in.	¾ in.	Sand gray lt. wgt. agg.	per c.y. del.
Atlanta	$4.16	$3.41	$3.10	$2.00	$2.00	$1.75	$2.10	$2.10	$1.65	$1.85	$0.1725	$11.00
Baltimore		3.39	3.14	2.40‡a	2.40‡a	1.95‡a	2.60‡a	2.70‡a	2.45‡a	2.85‡a	16	10.25
Birmingham	3.80	3.00	2.68	2.24	2.24	1.84	2.50	2.50	1.90	1.20	145	7.75
Boston		3.67	3.41	2.50a	2.50a	2.50a	1.90a	1.70a			100	205a 10.65k
Chicago	3.85 3.99	2.92 2.99	2.68 2.74	2.75‡b	2.75‡b	3.20‡b	2.75‡	2.75‡	2.00‡	2.00‡	20	206 9.70
Cincinnati	4.14	3.34	3.08	1.75‡c	1.75‡c	1.85‡c	2.00‡a	2.00‡a	1.80	1.80	185	205 11.65d
Cleveland	3.85	3.03	2.75	1.90‡f	1.65f	1.55	3.55‡a	3.55‡a	2.75‡	2.75‡	22	11.80g
Dallas	3.54	2.74	2.49	2.00	2.15	1.75	2.10	2.15			086e	125 9.90
Denver		3.54	3.29	1.85	2.00	1.15					20	25a 9.65
Detroit		2.98	2.74	3.25‡h	3.25‡h	3.00‡h	2.75 3.00‡	2.75 3.00‡	3.00‡	3.00‡	17	18a 9.85
Kansas City	3.95	3.13	2.88	1.60	1.60	1.50‡	1.90a	1.90a			17ai	215e 10.40k
Los Angeles		3.72a	3.32a	1.94‡a	2.04‡a	1.74‡a	1.92‡a	1.82‡a			12f	205 10.02k
Minneapolis	4.15ed	3.33ed	3.07ed	2.30‡aq	2.30‡aq	1.35‡aq	2.40‡aq	2.40‡aq			21e	10.50fk
Montreal		2.46ie	2.31ie	2.50‡i	2.60‡i		80ij	1.10ij			22	20a 9.05ee
New Orleans		3.05e	2.70e	2.32	2.32	1.82			1.05	1.25	25	12.40
New York	4.29	3.49	3.24	2.10‡d	2.10‡d	1.45‡d	2.35‡d	2.35‡d				10.50a
Philadelphia	3.93 4.23‡	3.13 3.43‡	2.87 3.17‡	2.45‡	2.55‡	2.05‡	1.90‡	1.95‡	1.50	1.50	.18 .22	10.80
Pittsburgh	3.90	3.18	2.85	2.05‡	2.05‡	2.00‡	2.50‡	2.50‡	2.05	2.05	214	214 10.85
St. Louis		2.99 3.05‡	2.80 2.86‡	2.40‡m	2.60‡m	2.40‡m	2.00 2.40‡m	2.00 2.40‡m	1.60	1.60	1.15	1.15 215 2.5ee 9.40
San Francisco		3.39	2.99	1.86	1.86	1.86	1.90					25e 10.15e
Seattle		3.55a	3.05a	2.75‡fm	2.75‡fm	2.75‡fm	3.50‡fm	3.50‡fm			22j	3135j 10.25j

† Delivered. * Prices incl. dealer rebate except as noted.
CEMENT: a Subj. to 10¢ disc. b Less 2% for cash. c C.L. price dealers' comm. not incl. d Dupints sell only C.L. e Plus switching charges.
SAND, GRAVEL, STONE & SLAG: a Truck lots. b Per c.y. c 3 tons or more. d Pea gravel. e Less 5% for cash. f Less than 5 tons. (Sales tax incl.) g Incl. quarry. h Barge lots del. i F.o.b. screw. Hoisson roof. m Less 2% for cash.
CONCRETE BLOCK: a Cinder. b Waylite. c Haydite. d Celocrete. e 8 x 8 x 12-in. f 8 x 4 x 16. g F.o.b. truck at job. i Less 2% for cash. j Less 1% for cash.
READY MIXED CONCRETE: a 5 cu. yds. or over del. Man. b 25 cu. yds. or more. c 10-100 cu. brackets. d Truck loads up to 500 cu. yds. e 2,000 lb. zoner. f 2,500 lb. comp. g Aver. haul 2-9 mi. note. h Less 50¢ for cash. i 5% off for cash. j 2% off for cash. k Sales tax included. l 1:2½:4.

CASH DISCOUNTS CEMENT to Contractors: Truck delivery, 2% for cash on 10th of month on carload deliveries, no trucking, same as dealer cash discount 10¢ per bbl. for payment within 15 days of date of invoice. Subject discount 10¢ per bbl. 20 days in Montreal.

CURRENT MAXIMUM PRICES AT CEMENT MILLS

Charge for bags not included. For cloth bags, add $1.05 per bbl., 25¢ refund allowed for each returnable bag; for paper bags add 25¢ per bbl., not refundable.

	Bulk		Bulk		Bulk		Bulk		Bulk
Richard City, Tenn.	$2.40†	Bolfington, Ind.	$2.30	Steelton, Minn.	$2.40	Muskegon, Mich.	$2.50†	Toledo, O.	$2.40†
Clinchfield, Ga.	2.40†	Independence, Kan.	2.30	Lewis, Ala.	2.25	Saginaw, Mich.	2.35†	Milwaukee, Wis.	2.50†
Kingsport, Tenn.	2.40†	Hannibal, Mo.	2.35	Duluth, Minn.	2.40	Wyandotte, Mich.	2.40†	Green Bay, Wis.	2.50†
West Des Moines, Iowa	2.45†	Northampton, Pa.	2.40	Hudson, N. Y.	2.40	Buffalo, N. Y.	2.40†	Ironton, O.	2.50†
Nazareth, Pa.	2.40†	Universal, Pa.	2.40	Alpena, Mich.	2.25†	Oswego, N. Y.	2.60†	Montreal City	2.15
Bath, Pa.	2.40†	Waco, Tex. (+ 10¢ tax)	2.30	Detroit, Mich.	2.40†	Cleveland, O.	2.40†	W. Winfield, Pa.	2.40†

†*Prices to hold for second quarter of 1950.*

PAVING BRICK, BLOCK, ASPHALT, ROAD OILS—F. O. B. CITY

	PAVING BRICK AND BLOCK			PAVING ASPHALT		ASPHALT BINDERS—FLUXES		CUTBACK ASPHALT		ROAD OIL	ASPHALT EMULSION (Quick breaking)	
	Granite Per M lots of 50,000 4x4x8 in.	Brick per M 3¼x4x8 in. carload lots	Wood per sq. yd. 3½ in. 16-lb. treat	Per ton, less than 80 penetration		Per gal., 80-300 penetration		Per ton		Per gal.	Per gal	
				Tank car	Drums	Tank car	Drums	Tank car	Drums	Tank car	Tank car	Drums
Atlanta	$73.00	$35.00	$2.25									
Baltimore	150.00‡	57.70‡		$21.00		$.085	$0.14	$.085	$.16	$.085a	$.085	$0.11
Birmingham		32.50										
Boston				24.50a	$35.50a	1036a	185a	115ae	205ae	10a	113a	205a
Chicago	155.00‡a	85.00 88.00‡b	2.70/3.50‡f	20.25‡	30.25‡	19.25‡e	26.25‡e	0825‡e	160	0756	1025 1025‡	15 1025‡
Cincinnati				19.00‡i		085	085	085i				
Cleveland		49.00‡	3.45g	24.00	33.50	24.00e	33.50e	10g	22e	10	11	25
Dallas	e	40.00	e	23.95	42.95	1012	1868	29.99	47.97	0887	1062	1423
Denver		43.00										
Detroit				20.65		12.00e		1086e		092		167
Kansas City		40.00d		18.05ed				075e	075e	0586e		
Los Angeles	e		e	12.50‡m		12.50‡e		14.00‡		12.50‡e	0775j	1525j
Minneapolis			2.83A	25.50	36.00	24.00e	33.00e	24.00	35.00	09	12	22
Montreal	137.00	e	e	27.00‡n	36.65n	16.70‡ne	18.70‡ne	16.30‡ne	18.30‡ne	13.20‡ne	174n	215ne
New Orleans				19.50e	e	10.50e	e	086e	e	0775	08	1425e
New York			2.35f	23.50	35.80g	22.50e	41.88g	0640e	1767ge	0800	0640	1747g
Philadelphia	150.00	110.00	4.06	23.00		22.00e		065e				
Pittsburgh	165.00	42.00	4.50	22.00	35.00	10	22	27.00	39.00	095	09	20
St. Louis				19.25f		1633		0881e		15		
San Francisco		62.75e		14.50g	30.00g	14.50g‡e		16.50g			08	14
Seattle				14.50A	35.00A	15.00de		1456e	2056e	16.00de	086	096

‡ Delivered.
PAVING BRICK & BLOCK: a C.L. b 3¼ x 4 x 8¼. c 2¼ x 5¾ x 4. d F.o.b. Buffalo, Penn. e Not used. f 2" interior 6¢ treat. g 3". h 8¢ treat.
ASPHALTS: a Price at plant, Everett, Mass. b F.o.b. refinery, Lockport, Ill. c F.o.b. Sugar Creek, Mo. d F.o.b. refinery, El Segundo. e F.o.b. Baton Rouge. f F.o.b. Wood River or Roxana, Ill. g F.o.b. Richmond, Calif. h F.o.b. Martinez. i Bulk refinery. j F.o.b. refinery, Englewood, Calif. k 50-110 penetr. l Less than 100 penetr. m 40-80 penetr. n Tax incl. o Drums not avail. p Shipped in steel tbls. q Use of used drums. r In customer's drums. s Shipped in drums, per drum. t 55-gal. drums. u Per 100 gal. v Per ton. w Per gal.

IRON AND STEEL PRODUCTS—PER 100 LBS. BASE MILL PRICES

	STRUCT. SHAPES PLATE	REINF. BARS Billet	RIVETS ½ in. struc tural	SHEET PILING Base	STEEL RAILS Per Net Ton Standard	Light	Re-rolled	TRACK SUPPLIES Angle Bars	Std Spikes	Tie Plates	Track Bolts
Birmingham Area	$3.40	$3.45	$7.25		$68.00	$75.00	Not	$4.40	$5.60	$4.20	
Chicago Area	3.40	3.45	7.25	$4.20	68.00	75.00	avail	4.40	5.60	4.20	
Pittsburgh Area	3.40	3.45	7.25	4.20	68.00	75.00	able	4.40	5.60	4.20	
Buffalo Area	3.45	3.45	7.25	4.20	68.00	75.00	....	4.40	5.60	4.20	$8.85
Cleveland			7.25								8.85
Youngstown Area		3.45							5.60		
Geneva	3.40										
Los Angeles		4.15							5.60		
Pueblo	3.40	3.45			68.00	75.00		4.40	5.60	4.20	8.85

IRON AND STEEL PRODUCTS—F. O. B. WAREHOUSE, PER 100 LBS., BASE PRICE

	STRUCTURAL SHAPES Per 100 lb. base price	5 tons to carload lot	REINFORCING BARS Per 100 lb. base price Rail steel	Add'l $ cwt. for switch	EXPANDED METAL LATH Per 100 sq. yd., carload lots Std. diamond mesh, 3.4 lb.	Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING Per 100 sq. ft., carload lots 4x19 in., No. 5 & 10 wires	4x12 in., No. 8 & 12 wires	6x6 in., No. 6 & 6 wires
Atlanta	$5.83‡	$5.225‡	$5.225‡	$.025	$.10 Del.	$31.50	$31.50		
Baltimore	6.05	5.06‡			.10	40.00	43.00		
Birmingham	5.4	5.25	5.25	.05	.15	42.00	44.50		
Boston	5.75a	5.50‡	5.50‡c	.10/.15	31.00	33.00			
Chicago	5.25	4.50ff	4.50ff	.0625	32.00‡	34.50‡			
Cincinnati	5.70‡e	5.54e			34.00zee	36.50zee			
Cleveland	5.35‡	4.45			.10 34.00	36.50‡			
Dallas	6.25	5.35	5.30		43.50	46.00			
Denver	6.65	6.25c			48.00	52.00gg			
Detroit	5.84‡	5.10n			.10 35.00	45.50			
Kansas City	5.95a	5.50g			34.00z	44.00z			
Los Angeles	5.70aa	5.30g			.15 38.00ff	40.00kk			
Minneapolis	5.61kk	6.12ll	6.12ll		.15 34.00	36.50			
Montreal	6.75	4.75a	4.75g		44.10A	46.80A			
New Orleans		5.10nn		.05	.10 38.50	41.00			
New York	5.65	5.58	5.33		.20 35.50tt	38.00tt			
Philadelphia	5.55	5.40			35.50‡	38.00‡			
Pittsburgh	5.90‡a.00	90 5.00			.10 32.50	34.50			
St. Louis	5.58‡	4.52e	4.32e		42.00zz	48.00zz			
San Francisco	6.00tt	5.75e			.15 37.50	40.00			
Seattle	6.05‡	5.35ef			52.00ssmm	42.00ssmmz			

A P M • Joliet, Illinois, Dubois, Penn. $.40
F.o.b. Mill Monessen, Penn. $.40

A P M • Joliet, Illinois, Dubois, Penn. $.40
F.o.b. Mill Monessen, Penn. $.40

A P M • Joliet, Illinois, Dubois, Penn. $.40
F.o.b. Mill Monessen, Penn. $.40

• At Producing Mill

‡ Delivered. a 4.5 tons add 35c. b Less than 1 ton add 50c. c 20 tons or over base. e F.o.b. plant. f Includes delivery in free delivery zone. g 10,000 to 30,000 lbs. h List price. i Dominion tax exempt. j Provincial and Municipal tax extra. z Plus Dominion, provincial and Municipal sales tax. j Price per ton. k F.o.b. city. l Intermediate and hard grade; new billet. m Per sq. yd. n 5 to 10 tons base. p Del. of 5000 sq. yd. or less. q Std. ribbed - 4 lb. per sq. yd. r 5 tons or over. z LCL. t Asphalt coated. u Note: Revised size extra. 1 in. 1¼ in. ½ in. 10c, ⅝ in. ¾ in. 15c, 1 in. 25c, 1¼ in. 50c, 1½ in. 80c, 2 in. $1.50. v Under 20 tons. Straight. w Copper bearing. z 2.5 lb. per sq. yd. aa 80,000# transportation tax included. z Copper alloy za Delivered truck to job. Contractor to do unloading. dd F.o.b. dock. ee F.o.b. cars. ff Carload lots. gg Including sales tax. hh 10,000 to 19,999 lbs. ii Rolled at Geneva mill. 400-3999 lbs. kk 4" rib lath. ll 5 to 8 tons. mm 2% off for cash.

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C.I. PIPE Per net ton f.o.b. 6 in. & 24 in.	std. 8 in.	VITRIFIED SEWER PIPE Per foot, Delivered ASTM C13-44T std. 12 in.	24 in.	36 in.	CLAY DRAIN TILE ASTM C4-24 Per 1,000 ft., car load lots, f.o.b. 6 in.	8 in.	CONCRETE SEWER PIPE Per ft., del. vered; ASTM C 14-41 12 in.	24 in.
Atlanta	$80.50	$0.43	$0.07	$1.00	$2.00	$114.00	$160.00	$0.45	$2.00
Baltimore	93.86	455	8775	1.05	3.94	156.00	210.39	70	2.25
Birmingham	82.50	40	72	2.84		210.00‡	275.00‡	00	2.50
Boston	97.46	413zzz	8235zzz	3.00zzz	10.00zzz	173.00	267.60	452‡m	3.60‡mj
Chicago	98.40	54	1.08	4.25	13.25	150.00‡	70.00‡	20	2.35
Cincinnati	94.90	455	8775	3.555	10.50	166.80‡	257.70‡	60	2.25‡
Cleveland	97.15	378z	7.20z	3.15	8.7125z	140.00	275.00	72 .m	2.75m
Dallas	99.28	365	652	2.63	6.25			49	1.60
Denver	104.30	4144	7.70‡	2.9844				7444	2.5644
Detroit	92.1	63	1.22	4.80	.12	200.00m	10.00m	65	.50
Kansas City	98.41	438n	74n			215.00m		602	.104
Los Angeles	111.06	490	9.07	4.532	11.208	163.00‡	324.60‡	72	2.0552
Minneapolis	91.80-100.67	63mm	1.12mn	4.50q				1.25hh	3.67h
Montreal	90.00	77s	1.35s	4.42z	7.23z			72.00ssz	218.00ssz
New Orleans	92.68	483	82	4.41	8.85*	235.00bb	412.00bb	65	2.29
New York	92.80-97.50	55	1.00	3.25	7.00			1.00	2.50
Philadelphia	90.47	50	1.05	4.15	10.25	210.00‡	300.00‡	1.35h	3.40h
Pittsburgh	97.70	36m	70m	2.70m	6.95m	147.50	230.00	1.05h	2.50h
St. Louis	94.27	48	92	3.80	9.00			1m	2.45m
San Francisco	111.06	554	1.084	4.684	11.204	165.00‡	325.00‡	09	2.85
Seattle	112.95	516	910			150.00		80ee	2.40ee

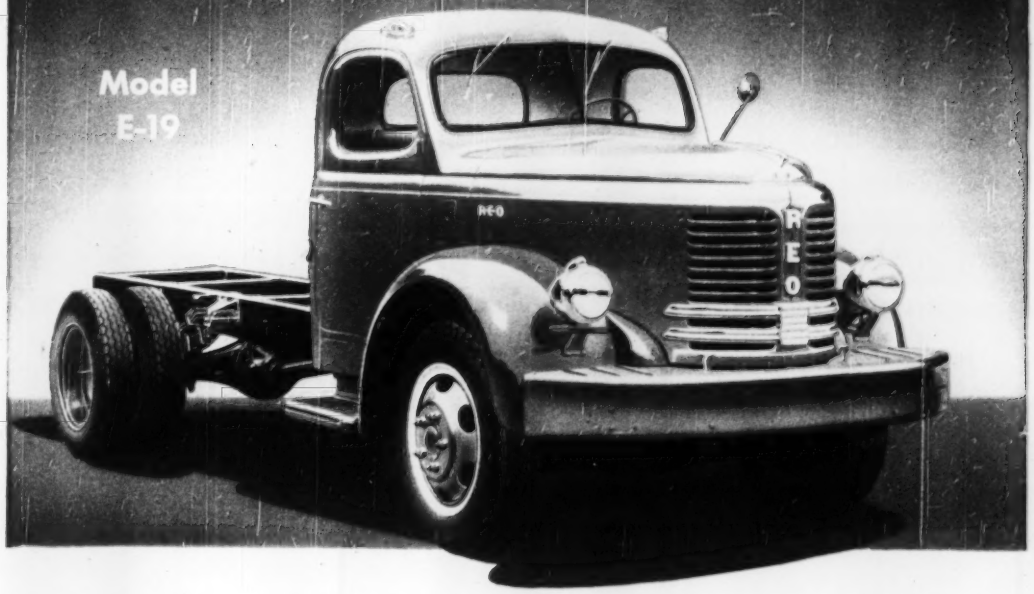
‡ Delivered. a B & S, class B, and better. b Hillsboro, N. H. basel $87.50. c Based on existing freight rates subject to rate change. d Base pipe and class A. $5 per ton additional. 4 in. 8 ft. standard; 6 in. 8 ft. and larger usually $1 per ton less. e Extra strength ASTM C 200-41. f 4 in. 8 ft. $85.67. h 30 in. i Steel pipe. Reinforced ASTM C 76-47. k Non reinforced ASTM C76-47. l Reinforced ASTM C76-47. m Contractor. n For 100 ft. o Each plant. p Truck deliveries. q Local prices based on LCL (no minimum). r Less than 5 tons per piece per ft. s Within switching limits. t ASTM A 74-50. u F.o.b. cars. v 2' lengths. w 3' lengths. z USA. A or 1941 specifications used. aa No standard specification in Can. bb Freight allowed to destination in city. cc Truck loads. f.o.b. plant. Newton. dd LCL, delivered. f.o.b. truck. ee 1% off for cash. * Not stocked; units made to order. ‡ 21".

*WROUGHT STEEL PIPE

(Full standard weight)

| | ½ in. | ¾ in. | 1 in. | 1¼ in. | 1½ in. | 2 in. | 2½ in. | 3 in. | 3½ in. | 4 in. | 4½ in. | 5 in. | 6 in. | 7 in. | 8 in. | 9 in. | 10 in. | 11 in. | 12 in. | 13 in. | 14 in. | 15 in. | 16 in. | 17 in. | 18 in. | 19 in. | 20 in. | 21 in. | 22 in. | 23 in. | 24 in. | 25 in. | 26 in. | 27 in. | 28 in. | 29 in. | 30 in. | 31 in. | 32 in. | 33 in. | 34 in. | 35 in. | 36 in. | 37 in. | 38 in. | 39 in. | 40 in. | 41 in. | 42 in. | 43 in. | 44 in. | 45 in. | 46 in. | 47 in. | 48 in. | 49 in. | 50 in. | 51 in. | 52 in. | 53 in. | 54 in. | 55 in. | 56 in. | 57 in. | 58 in. | 59 in. | 60 in. |
|---|---|---|---|---|---|---|---|---|---|---|---

NEW 1950
REO SPEED WAGON*



A real trailblazer for price and performance in the versatile, ton-and-a-half field.

- 14,500 lbs. GVW
- Reo-built engine
- 245-cu. in., seven-bearing
- Extra-heavy frame
- 100 per cent truck!

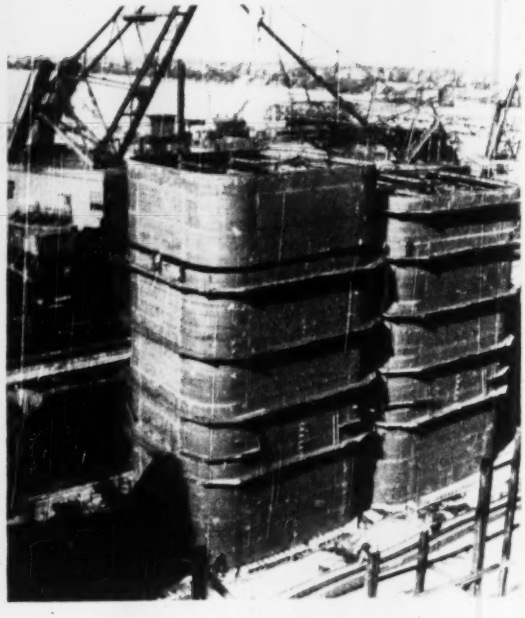
$1631.00 PLUS TAXES

REO
TRUCKS AND BUSES

Complete chassis and cab . . . 6.50 x 20 dual rear tires (larger sizes available). F.O.B. Lansing, Mich., plus taxes.

REO MOTORS, INC.
LANSING 20, MICH.

*Trademark Registered



FLOATING A 2000 TON BRIDGE CAISSON

The caissons shown at the left are two of six being built at Newport News for the York River Bridge in Virginia. They are fifty-two feet by sixty-six feet in cross section and were built to a height of 110 feet. During construction sixteen feet of concrete was poured around the six dredging wells of the bottom sections of the caissons for stability in floating. They were floated from the dry dock in which they were constructed and towed to the site of the bridge fifty-seven miles away.

In addition to caissons many other types of heavy equipment have been built at Newport News in recent months. The plant extending over 240 acres, includes complete machine, casting, forging and other facilities which offer all of the advantages for the execution of the complete job. Your inquiries are invited.

WRITE FOR ILLUSTRATED BOOKLET "FACILITIES AND PRODUCTS"

NEWPORT NEWS
Shipbuilding and Dry Dock Company
Newport News, Va.

LUMBER, TIMBER, PLYWOOD—PER M FT., B.M., CARLOAD LOTS F. O. B.

SHORT LEAF YELLOW PINE AND DOUGLAS FIR

All S. L. Y. P. is No. 2 common or better and for No. 1 N. C. Box. Prices in Bold Face: *All Fir boards, dimension, planks, No. 2. Fir small timbers and timbers are No. 1. Lengths up to 80 ft. Prices in italics.*

	1x6 S4S	1x8 S4S	2x4 S4S	2x6 S4S	2x8 S4S	2x10 S4S	3x12 S4S	6x12 Rgh	12x12 Rgh
Atlanta	† $70.00	$71.00	$60.00	$62.00	$65.00	$68.00	$70.00		
Baltimore	70.00	75.00	60.00	60.00	60.00	68.00	90.00		
	105.00g	*105.00g*	*105.00g*	*105.00g*	*105.00g*	*105.00g*	*105.00*	*105.75*	*105.75*
Birmingham	† 73.00	76.00	63.00	65.00	68.00	75.00	85.00		
	85.00	*85.00*	*65.00*	*65.00*	*65.00*	*85.00*	*81.00*	*81.00*	*81.00*
Boston	86.00	86.00	91.00	91.00	91.00	91.00	91.00		
	91.58	*91.58*	*91.58*	*91.58*	*91.58*	*91.58*	*101.158*	*101.158*	*101.158*
Chicago	‡ 91.92	92.93	82.83	91.92	93.94	95.96	100.00		
	‡*102.103*	*103.104*	*103.104*	*103.104*	*103.104*	*104.105*	*100.00*	*112.114*	*118.114*
Cincinnati	78.00	89.00	89.00	88.00	88.00	96.00	105.00		
	94.00	*96.00*	*94.00*	*94.00*	*94.00*	*96.00*	*94.00*	*120.00*	*120.00*
Cleveland	90.00	92.00	85.00	90.00	92.00	94.00	105.00	*125.00*	*105.00*
Dallas	‡† 60.00	66.00	61.00	53.00	56.00	57.00	90.00		
Denver	N.q. in stock		*116.00*	*118.00*	*118.00*	*120.00*	*116.00*	*148.00*	*150.00*
Detroit	95.00	97.00	80.00	89.00	92.00	93.00			
	90.00	*90.00*	*91.00*	*90.00*	*91.00*	*93.00*	*90.00*	*98.00*	*98.00*
Kansas City	105.00	111.50	112.00	112.00	115.00	120.00			
	105.00	*111.50*	*112.00*	*112.00*	*115.00*	*115.00*	*120.00*	*135.00*	*135.00*
Los Angeles	* *105.00*	*105.00*	*101.00*	*101.00*	*101.00*	*101.00*	*115.00*	*138.00*	*115.00*
Minneapolis	‡§ *120.00*	*120.00*	*120.00*	*120.00*	*120.00*	*120.00*	*120.00*	*135.00*	*135.00*
Montreal	‡& 70.00	74.00	70.00	72.00	75.00	83.00			
	140.00	*140.00*	*140.00*	*140.00*	*140.00*	*140.00*		*153.00*	
New Orleans	† 75.00	78.00	74.00	75.00	78.00	80.00	*100.00*		
	† *77.00*	*78.00*	*76.00*	*78.00*	*78.00*	*78.00*	*72.00*	*71.00*	*100.00*
New York	‡ 102.50	110.105	112.50	105.115	105.115	110.120	125.135		
	‡		*Range from $125.00 to $145.00*				*125.135*	*125.135*	*125.135*
Philadelphia			**Range from $88.00 to $97.00**				88.97		
			Range from $110.00 to $150.00				110.120	*110.150*	*110.150*
Pittsburgh	† 75.85	75.85	80.85	75.85	75.85	80.90	100.00		
	† *90.100*	*90.110*	*90.110*	*90.110*	*90.110*	*90.110*	*120.150*	*180.00*	*180.00*
St. Louis	‡§ 97.00	99.25	86.50	92.50	94.25	99.65	99.75	103.105	
	‡§		*119.00*	*121.75*	*123.50*	*127.90*	*123.50*	*145.55*	*145.55*
San Francisco	† 65.00	65.00	65.00	66.00	66.00	65.00	65.00	65.00	65.00
Seattle	† 75.00	75.00	75.00	75.00	75.00	75.00	75.00	75.00	75.00

† F.o.b. mill. ‡ Delivered. e Retail-LCL. * Yard prices.

‡ MILLER: **Bold Face type, Southern Pine.** *Italics, Douglas Fir.* a Spruce & Tax exempt. c 5M lots. d 8-12 ft. lengths. e 8-16 ft. lengths. f 18 ft. or under. g No. 1 common. h 10-12 ft. lengths. i 8 ft. lengths. j 10-16 ft. lengths. k No. 3 common. l 14-16 ft. lengths.

PLYWOOD: Special concrete form grade Fir Plywood, 4' by 8' panels, 5-ply, satisfied 2 sides, water resistant glue, carload lots delivered per 1,000 sq. ft. surface. Seattle base price on ⅜", $86.00; on ½", $100.00. For other centers add rail freight increment from table on proper size. Oiling and edge sealing charges included. Lower rate by water shipment. † 50,000 lb. minimum. * Freight rate increase of 10 per cwt. not included in these figures.

LONG LEAF Y. P. Merchantable grade up to 20 ft.	2x12 Rgh	12x12 Rgh
	$1.40.00	$1.40.00
	115.00	125.00
	114.00	114.00
	116.118	116.118
	88.00	88.00
	92.00	.....
	.....	.....
	.....	.....
	.....	.....
	130.00	130.00
	.....	.....
	.....	.....
	.....	.....
	210.240f	210.240f
	180.00	180.00
	.....	.....
	.....	.....
	.....	.....
	.....	.....

PLYWOOD Rail freight increment (See note for base price)	⅜"	½"
	$22.32	$27.24
	22.86	27.90
	21.78	26.58
	22.86	27.90
	18.72	22.80
	21.78	26.58
	22.20	27.12
	18.72	22.80
	13.92	16.98
	21.78	26.58
	.....	.....
	16.58	20.16
	.....	.....
	13.38a&b	16.28a&b
	16.56	20.16
	.....	.....
	.....	.....
	18.72	22.80
	.....	.....
	22.86	27.90
	22.86	27.90
	.....	.....
	22.86	27.48
	.....	.....
	18.72	22.80
	.....	.....
	10.08a	12.30a
	.....	.....

GLASS, EXPLOSIVES, CHEMICALS

	WINDOW GLASS Discounts from jobbers' list, Feb. 1, 1950: Single or Double Thickness A quality	B quality	EXPLOSIVES Per lb. 40% Ammonia Gelatin in 50 lb. cases delivered in 200 lb. lots*
Atlanta	76%c	76%c	$0.2025
Baltimore	88-10%†	82-10%	.2025
Birmingham	83%c	83%c	.1875
Boston	82%	82%	.2025
Chicago	81%	81%	.2025
Cincinnati	81%	81%	.2025
Cleveland	81-10-10%	81-10-10-10%	.2425
Dallas	75%	75%	.215
Denver	68.5%	68.5%	.2075
Detroit	81-10-10%	81-10-10%	.2025
Kansas City	65-14%	65-10%	.2078
Los Angeles	56%	61%	.21
Minneapolis	80-10%	80-10%	.2075
Montreal	40-5%c	40-10-5%c	18.15c
New Orleans	81%	81%	.2125
New York	81%	81%	.32c
Philadelphia	80%	82%	.2025
Pittsburgh	82%	82%	.175
St. Louis	76-10%	70-10%	.2075
San Francisco	66%c	73%c	.2075
Seattle	74%	55%c	.21

Price of 40% Ammonia Gelatin = $0.0125 per lb. higher than 40%

Glass, a Jobbers' list price per box 14 x 20 in. is $12.75 for A quality, $7.50 for B quality; 14 x 20 ds $8.00 for A quality, $5.25 for B quality. b Discount from list, Sept. 1949; sales tax included. List 60% tax exemption not allowable for. c Single thickness. d Discount from list of July 16, 1949. † Effective 30%. ‡ Disc. from list of Aug. 15, 1948.

Explosives: § Urban prices subject to service charges or local storage and delivery regulations. In rail connected territory, carload prices in less congested areas. In borough of Kings, Queens and Richmond and in Manhattan south of Canal St., add delivery charge of $1.00 per ton. a F.o.b. city per 100 lb. b Prices $0.10 c Prices $0.15 d F.o.b. Belmont, near Montreal.

40% Ammonia Gelatin price ranges in other than urban areas, per lb. except Seismograph Grades:

	C. L. 20,000 lb. net	Tons	200 lb. lots
E. of the Miss., except Fla. and Me.	$0.155	$0.1825	$0.2025
W. of Miss. to Rocky Mtn. States			
Fla. and Maine	.16	.1675	.1875-.20	.2075-.22
Rocky Mtn. States	.16	.1725	.1875-.20	.2075-.225
Pacific N. W. States	.1575	.17	.19	.2025	.21	.2225
Pacific S. W. States	.155	.1625	.1875	.195	.2075	.2175

PILES, TIES F. O. B.

PILES

Prices per lineal foot, for sand pine, butt 60% f.o.b. cars, New York. Fir based on Wash. and Ore. points to New York shipping area, price based on freight from Norfolk.

Dimensions	Points	Length	By Rail—Pine*	Fir
12-in. at butt	6-in.	30 to 50-ft.	$0.44	.....
12-in.—2-ft. from butt	6-in.	50 to 56-ft.	.66	.....
12-in.—2-ft. from butt	6-in.	60 to 80-ft.	.90	.....
12-in.—2-ft. from butt	6-in.	90 to 100-ft.	.....	.74
13-in.—2-ft. from butt	6-in.	90 to 100-ft.	.....	.80
14-in.—2-ft. from butt	6-in.	50 to 60-ft.	.50	.87
14-in.—2-ft. from butt	6-in.	70 to 76-ft.	.54	.81
14-in.—2-ft. from butt	5-in.	80 to 85-ft.	.07	.82
14-in.—2-ft. from butt	5-in.	85 to 86-ft.	.....	.83
14-in.—2-ft. from butt	5-in.	90 to 100-ft.	.....	.87

* Pine piling over 80-ft. available only in limited quantities.

RAILWAY TIES

Prices f.o.b. per tie for carload lots:

		6"x8"x8' Untr.	6"x8"x8' Tr.	7"x9"x8'6" Untr.	7"x9"x8'6" Tr.
Boston	Oak	e			
	Pine	e			
New York	S. L. Sap Pine	$1.65	$2.85	$2.90	$3.36
	Mixed Oak	1.80	3.05	2.50	3.90
Birmingham	Hardwood	1.00	1.66a	.....	2.25a
Chicago	Red Oak		2.50-2.60a	.....	3.52/3.45a
Los Angeles	Douglas Fir				
	Redwood				
Philadelphia	Red Oak	2.33	3.13a	3.10	4.25a
St. Louis	White Oak	2.40		3.10	.....
	Red Oak	2.30	3.00a	3.00	3.90a
	Sap Pine or Cypress	2.80a		3.50	
San Francisco	Douglas Fir	1.25c	2.24c/f	1.70f	3.05c/f
Montreal	Birch or Maple	h	h	h	h

Tr.—Treated. Untr.—Untreated. a Creosoted. b 7"x9"x8'. c 6 inches. d Green. f F.o.b. cars. h No constant price available. e Not available.

CHEMICALS

Water, sewage treatment, road work, f.o.b. carlots, New York

Bleaching powder in drums f.o.b. works per 100 lb.	$4.50
Chlorine cylinders, liquid, per lb. f.o.b. works	.08-.12
Calcium chloride, 77-80%, flaked, 100-lb. paper bag, f.o.b. works, ton	22.00
Silicate of soda, 52 deg. in drums, f.o.b. works, per 100 lb.	1.80
Soda ash, 58%, in paper bags, per 100 lb. dense	1.35
Sulphate of aluminum, commercial, in 100-lb. bags f.o.b. works	1.50
Sulphate of copper, in bags, 99% per 100 lb. f.o.b. works	7.60

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE PARTITION — SCORED Per M. lots of 2,000 pieces or over			STRUCTURAL CLAY TILE — LOAD BEARING — SCORED Per M. lots of 2,000 pieces or over			BRICK Per M. in quantity		LIME Per ton, In paper, Carload lot.		
	3x12x12 in.	4x12x12 in.	8x12x12 in.	8x12x12 in.	10x12x12 in.	12x12x12 in.	Common backing	Straight hard	Hydrated finishing	Common hydrated	Pulverized, or lump
Atlanta							$25.00	$25.00	$19.00	$17.50	$17.50
Baltimore	$175.00	$185.00	$325.00	$380.00			33.00k	36.00k	26.00	26.00	
Birmingham	97.50	104.00	195.00	231.00			20.00f	22.50kp	24.74	16.30	
Boston	140.00†	149.00†	280.00†	317.00†			32.00s	35.00s	30.80†	26.40†	
Chicago	115.00	122.50	230.00				21.00	23.00	28.50	23.00	
Cincinnati	170.00y	180.00y	240.00ddd	295.00f			32.25j	44.00p	24.25j	24.25j	24.25
Cleveland	118.00cc	126.00cc	236.00cc				28.50	28.50	24.00	22.00	27.50ae
Dallas		110.00					18.75	33.25	31.00	21.80	
Denver							32.00	32.00	34.80bb	28.00bb	34.00bb
Detroit*	117.08	124.88	234.15		$280.80	$332.22	32.50cc	31.00cc	28.00	26.50	
Kansas City	115.50	122.50		245.00	303.50	367.00	24.25p	24.25p	36.00p	32.00p	30.00p
Los Angeles	r	r	r	r	r	r	29.00ff		36.00	36.00	32.00
Minneapolis	158.00p	176.00p	330.00p	176.00sep			31.25ep	35.25	35.00bbe	26.00bbe	35.00bbde
Montreal	115.00aq	125.00aq	255.00aq				25.50	35.50	22.40x		22.40
New Orleans	160.00	160.00	300.00				29.00		38.00	26.00	37.50
New York	118.20h	126.00h	173.30eh	189.50hn			33.00		34.40	26.80	
Philadelphia	126.30	134.80	252.60	302.74	361.35	455.74	27.00	30.00	31.00	19.50	24.50
Pittsburgh	98.00	105.80	181.85	202.30	265.35	303.60	26.00	38.00p	24.00	19.00	2.87ne
St. Louis	120.00	135.00	252.00	252.00	339.00		34.50ad	32.50ad	60.80aap	60aap	1.00aapee
San Francisco	132.00n	148.50n	198.00ddn	148.50hn			33.00		25.30	25.30	2.48ne
Seattle	150.00cc	160.00cc		150.00cccc			32.00e	39.00e	34.00ehh	34.00ehh	3.60mhh

† F.o.b. yard Roxbury. a Smooth. b Per 50 lb. bags. c 6 x 12 12. d 5¼ x 8 x 11½. e Tax exempt. f 8 x 8 x 12. g Sand lime. h 5 x 8 x 12. j Pebble lime price per 80 lb. sack. k Price per sack. Lime not sold per ton. m f.o.b. trucks, job site N.Y.C. n f.o.b. warehouse city. p Truck load or over. q $1.00 discount. r Red face. s Per bbl. 180 lb. t 7½ x 7½ x 12. Speed title. u f.o.b. Buffalo. v Truck lots. w Provincial and Municipal tax extra. x Not used because of earthquake danger. y 2% discount for cash. z Delivered. aa Note: Red lead in oil 50c higher than white lead in oil. ab Red lead prices change frequently due to pig lead price changes. ac U. S. War Dept. Spec. 3-49A. ad ASTM Spec. D260-31. ae 80% minimum ferric oxide. af 15 lb. ag Per 432 sq. ft. ah Per roll. 65 lb. ai Not carload lot prices. aj Minneapolis and vicinity. ak Asphalt pitch. al Per cwt. am Not used. an 1% discount for cash. ao May 1941 price. ap Per 60 lb. aq Delivered. ar Per 66-ft. roll. as F.o.b. factory, Chicago. at ASTM Spec. D266-41. au Federal tax included. av Per 90 lb. square. aw Per ton. ax Price to large paint contractors is $1.25 less. ay Mineral surfaced. az 5-gallon container. ba Approximate cost per 100 lb. bb 66 Boilers coating and cement. Price per ton. bc f.o.b. truck, delivery. bd 2% cash discount. be Asphalt, in 100 lb. package. bf 5-gal. drums. bg f.o.b. factory.

PAINT, ROOFING—F.O.B. CARLOAD LOTS

	RED LEAD Per 100 lb. in 600-lb. (Approx.) bbl. Dry a	WHITE LEAD Per 100 lb. in 100 lb. casks In oil ac	READY-MIXED PAINT Per gal., drums Graphite b	Aluminum c	Ferric Oxide d	ROOFING SUPPLIES Carload lots f.o.b. factory Roll roofing surfaced, 85-90 lb. per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating, per gal.	Tar pitch, 200 lb. bbl. per ton
Atlanta	$15.75	$26.375	$1.75	$2.70	$1.65	$2.00ai	$2.00ai	$2.00ai	$1.00ai	$30.00ai
Baltimore	15.50	26.00	2.10	4.27	2.90	2.99	3.94	3.94	.55	36.00
Birmingham	15.75	26.375	3.90	3.40		2.80	2.75	2.75		40.50ae
Boston	15.50	26.00				2.68ak		2.67‡ag	.36	34.00
Chicago	15.50	26.00				2.34‡e	2.54‡e	2.54‡e	34.00‡bbe	37.00‡
Cincinnati	15.50	26.00	2.90	2.90		2.44‡	2.54‡e	2.54‡e	.35g‡	40.80‡
Cleveland	15.50	26.00	2.50ppg	2.75ppg	2.35	2.26e	2.26e	2.26e	.30g	31.00
Dallas	15.75	26.75		4.05		3.50g	3.75e	4.35e	.36	46.00
Denver	16.00	26.50	2.63	4.38	2.48	3.20e	2.20e	2.20e	.41g	40.00
Detroit	15.50	26.00	2.35	3.30	2.50	2.29	2.29f	2.29	.418	35.00
Kansas City	15.50	26.12								
Los Angeles	15.50	26.25	2.80	3.75	3.50	2.35	1.58e	t	.36	t
Minneapolis	15.50	26.12-28.55				2.07add	2.18add	2.18add	.33bdd	34.00e
Montreal		27.00	3.75t	4.20t	3.62t	3.25t	3.00tf	3.00tf	.75tf	2.60tf
New York	15.50	26.00	3.40y			2.32	2.41e	2.41e	.34u	35.00
Philadelphia	15.50	26.00	3.25	3.65	3.15	2.54	2.94	2.94	.37	26.00
Pittsburgh	15.50	26.00	2.00	2.00	1.90	2.75	2.75e	2.75e	.37	38.00
St. Louis	15.50	26.00				2.84	2.54h	2.54h	.37e	37.00
San Francisco	15.50	26.25	1.80	2.75n	1.35	2.27	3.00ee		.38g	
Seattle	15.50	26.50	2.40m	2.67m		3.23mgee	2.71hmee		.56mee	48.75me

‡ Delivered. Note: Red lead in oil 50c higher than white lead in oil. a Red lead prices change frequently due to pig lead price changes. b U. S. War Dept. Spec. 3-49A. c ASTM Spec. D260-31. d 80% minimum ferric oxide. e 15 lb. f Per 432 sq. ft. g Per roll. 65 lb. h Not carload lot prices. Minneapolis and vicinity. j Asphalt pitch. k Per cwt. m Not used. n 1% discount for cash. o May 1941 price. p Per 60 lb. q Delivered. r F.o.b. factory, Chicago. s ASTM Spec. D266-41. t Federal tax included. u Per 90 lb. square. v Per ton. w Price to large paint contractors is $1.25 less. x Mineral surfaced. y 5-gallon container. z Drums. aa Approximate cost per 100 lb. bb 66 Boilers coating and cement. Price per ton. cc f.o.b. truck, delivery. dd 2% cash discount. ee Asphalt, in 100 lb. package. ff 5-gal. drums. gg f.o.b. factory.

SKILLED AND COMMON WAGE RATES—PER HOUR

	Bricklayers	Carpenters	Struct. Iron Workers	Hoisting Engineers	Plasterers	Electrical Workers	Steamfitters	Common Labor Building	Common Labor Heavy Const.
Atlanta	$2.50	$1.85	$2.125	$2.00	$2.25	$2.25	$2.00	$0.90	$0.95
Baltimore	3.00	2.35	2.65	2.50-2.80	2.50	2.40	2.40	1.35	1.35
Birmingham	2.50	1.90	2.20	1.875	2.20	2.25	2.25	1.00	1.10
Boston	2.775	2.25	2.55	2.60	2.70	2.60	2.45	1.75	1.75
Chicago	2.925a	2.38a	2.60	2.50	2.55	2.525	2.45	1.90a	1.90a
Cincinnati	2.575	2.25	2.425	2.375	2.425	2.45	2.40	1.535	1.535
Cleveland	2.70	2.205d	2.70	2.70	2.70	2.70	2.70	1.975	1.85
Dallas	2.50f	2.125	2.25	2.25	2.50f	2.375	2.375	1.375	1.375 1.50
Denver	3.00	2.10	2.10	2.25	2.50	2.41	2.40	1.40	1.45
Detroit	2.75	2.50	2.70	2.70	2.80	2.75	2.925	1.80	1.80
Kansas City	2.65	2.20	2.35	2.425	2.80	2.475	2.55	1.625	1.625
Los Angeles	2.75	2.12	2.38	2.07	3.125	2.50	2.50	1.87	1.87
Minneapolis	2.40	2.12	2.275	2.07	2.50	2.35	2.32	1.82	1.52
New Orleans	2.60	1.975	2.35	2.225	2.225	2.40	2.35	1.10	1.10
New York	3.20i	2.75h	3.00	3.00	3.20i	3.00i	2.75h	1.70	1.70
Philadelphia	3.31i	2.525	2.80i	2.50	3.075i	2.975i	3.125	2.075i	1.475	1.775
Pittsburgh	3.00	2.05	2.625	2.55	2.825	2.575	2.80	1.50	1.50	1.50
St. Louis	2.833c	2.45k	2.50	2.55	2.75	2.55c	2.50	1.65	1.40	1.75
San Francisco	3.00g	2.225	2.50	2.10	3.00	2.50	2.50	1.55		1.55
Seattle	3.00	2.195	2.365	2.33	2.695	2.395	2.50	1.795	1.85	1.85
Montreal*	1.40	1.25	1.25	1.20	1.40	1.35	1.55	.90		.80

a 6 hr. day. b 7 hr. day. c Incl. 3% vacation stamps fund for bricklayers, 2½% for electricians. d Cost of living bonus now included in base wage. e Includes 6¢ per hr. tool replacement. f Plus 5% (80 daily bonus. g $2.20 bonus and hoisting. h 3% vacation fund. i Incl. 5¢ hr. welfare. j Incl. 5¢ hr. welfare. k Incl. 7½¢ hr. welfare fund. l Incl. 4% vacation fund. m Incl. 6¢ hr. welfare ins. fund.

MEXICO CITY PRICES

In Pesos, F.o.b. City		Apr. '50	May '50
Common Wages—Building (8 hr. day)	av. per hr.	.53	.53
Common Wages—Heavy Const. (8 hr. day)	av. per hr.	.69	.69
Skilled Labor Wages			
Carpenters (8 hr. day)	av. per hr.	1.88	1.88
Bricklayers (8 hr. day)	av. per hr.	1.50	1.50
Struct. Iron Workers (8 hr. day)	av. per hr.	1.50	1.50
Struct. Steel Shapes 4" 15" x 12 meters	per ton	925.25	925.25
Reinf. Steel, Corr. Rods ½" x 11 meters	per ton	1,075.00	1,010.00
⅝" x 11 meters	per ton	1,065.00	1,000.00
¾" x 11 meters	per ton	1,055.00	990.00
⅞" x 11 meters	per ton	1,045.00	980.00
1" x 11 meters	per ton	1,045.00	980.00
1" x 11 meters	per ton	1,045.00	980.00
Gravel, truck load of 3½ cu. meters Blue Gravel	per tr. load	32.00	32.00
Rose Gravel	per tr. load	36.00	36.00
Cement, Std. Port. (Tolteca)	per ton	115.00	115.00
Lumber Mex. Sawed Fir (Oyamel)	per M ft.	600.00	600.00
1st Class Pine	per M ft.	750.00	750.00
2nd Class Pine	per M ft.	680.00	750.00

ENR Skilled Average: (Bricklayers, Carpenters, Ironworkers) $2.517. **ENR Common Average:** $1.528

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YOUNGSTOWN 1, OHIO
Warehouses and sales offices in principal cities

Construction view, State Office Building, Jackson, Miss. Architects: E. L. Malvaney & Assoc. Structural engineer: Harry Howe. Contractor: J. A. Jones Construction Company.

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Slab band floor construction, which was used in the State Office Building in Jackson, also permits a reduction in total building height. This saving is due to the elimination of the headroom required by conventional beams and girders in other types of construction.

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CONSTRUCTION REPORTS–Second Section

WATER SUPPLY

BIDS ASKED

Md., Hyattsville—B. A. 6/24—Washington Suburban Sanitary Comm., 4017 Hamilton St., Hyattsville. Approx. 3,500 lin. ft. 24-in. C.I. pipe Class 250, cement lined, tar and asphalt sdc. CWP & B.

† Mississippi—B.A. 6/14—U. S. Eng., P. O. Box 97, Memphis, Tenn.—relief wells and appurtenant works, Tunica Co. Civil Wks. 40-241, 50-152.

† R. I., Providence—B.A. 6/15—Office of Commandant (CDR. C. J. N. Officer in Charge of Construction, First Naval Dist. Headquarters, 495 Summer St., Boston, Mass.—installing water lines at U. S. Naval and Marine Corps Reserve Training Center, Spec. 2-50. Plans deposit $10.

Ky., Morehead—B.A. 6/15—City Council Chambers, City Hall—Contr. 1, water reservoir, chlorine building, city yards, control valves, water distr. sys. Contr. 2, water distr. sys. Asst. engrs. Plans deposit $25. The Chester Engineers, 210 E. Parkway, Pittsburgh 12, Pa., engrs. CD 5/18.

O., Dayton—B.A. 6/15—Comrs. Montgomery Co., Courthouse—2 pump stations at Liming Rd., in Greater Miami Water Dist.

† Mississippi—B.A. 6/19—Natchez Trace Parkway—Highway, Park Administration Bldg., water, sewer & electric systems, orientation Center and Maintenance Area, Sect. 1-D, Natchez Trace Parkway, on east and west sides of U. S. Hy. 61, approx. 9 mi. north of Jackson. Plans deposit $10.

Wis., Cudahy—B.A. 6/19—City Comp. Water Dept., 6 in. water mains, valves, hydrants, services, etc. Asst. engr. CD 5/15.

† N. M., Albuquerque—B.A. 6/20—U. S. Eng., P. O. Box 1658—repair to tertiary levee system, Unit 19,720 lin. ft. N. side to S. of exist. levee 1 mi. W. of U. S. Hy. 66 and 4 mi. southeast of here. Invitation 21, Serial No. Eng. 29-800-50-60. Plans deposit $10.

Tex., Houston—Bids Asked—6/20—Exec. Comm. Peace St. sanitary sewer, Memorial Dr. area, west of Post Oak Rd. $60,000. R. V. Hatcher & Assoc., 2541 Times St., engrs.

LOW BIDDERS

▲ Pa., Allentown—City, City Council, 626 Linden St.—Contr. 1 and 2, Airport Area Development Program, Inc., 315 Market St., Camden, N. J., $1,871,600. Contr. 3, pumping and electrical work to Draco Corp., Draco Bldg., Pittsburgh, $386,625. Bids 4/25. Awarded 5/16. CD 5/8 under LB.

SEWERS, WASTE DISPOSAL

BIDS ASKED

Ky., Morehead—B.A. 6/15—City Council Chambers, City Hall—Contr. 1, intercepting sewers, relief sewer connections, lateral sewers, revisions of existing septic tank appurtenances. Contr. 2, intercepting sewers, lateral sewers, appurtenances. East End Section. Contr. 3, lateral sewers, connections appurtenances, West End Section. Plans deposit $25. The Chester Engineers, 210 E. Parkway, Pittsburgh 12, Pa., engrs.

Mass., Boston—B.A. 6/15—Commonwealth of Mass., Metropolitan Dist. Comm., 20 Somerset St., Boston—Contr. 1, exclu. Irving 14 ft. diam. and 240 ft. deep shaft 2, and excav. 200 ft. tunnel on either side with 11½ and 11½ ft. diam. tunnel headings, North Metropolitan Relief Tunnel of North Metropolitan Sewerage Dist., Chelsea. Plans deposit $15.

N. Y., Rochester—B.A. 6/15—Bd. Sewer Comrs., 10 Gibbs St., adms. to Allens Creek Disposal Plant of Brighton Sewer Dist. 2. William S. Lozier Co., 10 Gibbs St., engrs. CD 5/17.

Mass., Dudley—B.A. 6/17—Town Pub. Wks. Dept., Town Hall—1 mi. of 10- to 16-in. sewers, Contr. A, and 7 sanitary streets, $110,000. Hyley & Ward, 73 Tremont St., Boston, engrs.

Calif., Merced—B.A. 6/19—City, City Hall, sanitary sewers for sewerage plant. Plans deposit $25. Sewage treatment plant. Plans deposit $50. Approx. $50,000. G. E. Worton, City Hall, city engr. CD 11/17/49.

Ore., Hermiston—B.A. 6/19—City, City Hall, sanitary sewerage sys., 8,800 ft. 18-in. and 1,200 ft. 8-in. pipe. Plans deposit $20. Stevens & Cook, Spalding Bldg., Portland, engrs. CD 5/17.

Calif., Los Angeles—B.A. 6/20—Bd. Supervs., Los Angeles Co., 383 Hall of Records, Contr. 1, sewers in 134 Cr. E. 109th Hawthorne, $121,638. C. E. Arnold, engr. CD 5/4/49.

Calif., Nevada City—B.A. 6/20—City, City Hall, sewage treatment plant. Approx. $50,000. Plans deposit $25. Hesselton, Ferguson & Carollo, 3108 N. 3 St., Phoenix, Ariz., engrs. CD 5/1.

† N. J., Somerville—B.A. 6/20—Veterans Admin., Vermont Ave. between H and I Sts. N.W., Wash., D.C.—sanitary sewers and incidental fencing for Veterans Administration Supply Depot Steel Unit, Somerville, N. J.

Calif., Los Angeles—B.A. 6/22—State Dr. Hwy., 120 Spring St.—conc. storm and storm drains in Hollywood Freeway and in city streets near Santa Monica Blvd., Los Angeles Co., G. T. Milloy, Sacramento, state hy. engr.

Tex., Houston—Bids Asked—C. D. Beeler, 2300 Peace St.—sanitary sewers, Memorial Dr. area, west of Post Oak Rd. $60,000. R. V. Hatcher & Assoc., 2541 Times St., engrs.

LOW BIDDERS

▲ Ind., Mishawaka—Bd. P. Wks., City Hall, May 18—sewage treatment plant, from Peter Schimmer & Son, 321 S. Spring St., $849,018. Intercepting sewers and sewer extensions, Twin Branch Sewer and Work No. 1 Sewer, from Sanborn Co., Lake Bldg., Gary, $990,917. Northeast Sewer, from Lowell Corp., 2108 Dowling Ave., Indianapolis, $84,742. Chas. W. Cole & Son, 220 W. La Salle Ave., South Bend, engrs. CD 11/15/49.

CONTRACTS AWARDED

▲ Ill., Chicago—City, City Hall, Zone 2. Contr. 2-A, sewers, Kinzie Ave. system of auxiliary outlet sewers, S. M. J. Boyle & Co., 2214 N. Clark St., Zone 20, $1,224,440. Awarded 5/4.

BRIDGES

BIDS ASKED

STATE HIGHWAY LETTINGS

June 13	June 21
Maryland	California
June 15	Delaware
Virginia	June 22
June 16	California
Tennessee	June 23
June 20	Alabama
Texas	Pennsylvania

Pa., Monessen—B.A. 6/28—Assr. of Property Tax, Monessen City Hall—Contr. 1, to Rees Ave., Bridge Plans deposit $15. The Chester Engineers, 210 East Park Way, Pittsburgh, Zone 12, engrs.

LOW BIDDERS

▲ Ill., Chicago—Cook Co., County Bldg., Zone 2, eight 1-span, open-grade joints of Touhy Ave. to north of Devon Ave., north of Caldwell Ave. to north of Devon Ave., north of Devon Ave. to north of Lawrence Ave., north of Lawrence Ave. to north of Foster Ave., north of Foster Ave. to north of Ainslie Ave., north of Ainslie Ave. to north of Winnemac Ave., north of Winnemac Ave. to north of Lawrence Ave., Mayfield Rd. Bridge, Cook Co., $1,490,068. Irving Edens Superhighway, 1-span, open-grade joints of Touhy Ave. to north of Devon Ave., north of Devon Ave. to north of Lawrence Ave., north of Lawrence Ave. to north of Foster Ave., north of Foster Ave. to north of Ainslie Ave., north of Ainslie Ave. to north of Winnemac Ave., north of Winnemac Ave. to north of Lawrence Ave., Mayfield Rd. Bridge, Cook Co., $546,181. Irving Edens Superhighway, 1-span, open-grade joints

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† N. D., Fargo—B.A. 6/27—Veterans Admin., Munitions Bldg., Wash. 25, D. C., roads, walks, parking area for Veterans Admin. Center, Spec. 5099, Proj. No. 8-4230.

Tex., San Antonio—Bids Asked—John P. Pfeiffer & Assoc., 619 Security Title Co., South Texas Bldg., street constr., asph. paving, 114 acre tract off Culebra Rd. and Hillcrest Dr., $75,000.

LOW BIDDERS—

▲ Pennsylvania—State Hy. and Bridge Auth., Harrisburg, May 26, construct divided highway consisting of rein.-con. pavement 24 ft. wide on each side of an earth or concrete divisor incl. the construction of rein.-con. arch, rein.-con. pavement, variable in width 44 to 52 ft. incl. construction of rein.-con. arch, crushed aggregate base with bit. surf. 22 ft. wide, construct I-beam bridge and misc. constr., construct divided highway consisting of rein.-con. pavement 24 ft. wide on each side of an earth or concrete divisor, incl. the construction of 6 rein.-con. arches and 3 rein.-con. bridges, construct continuous deck I-beam bridge and construct concrete deck steel arch and continuous I-beam bridge 30,043 ft. L. R. 764, I. 2-21-257 (w), Campbells Run Road, relocated T. R. U. S. 30 and 22, the Penn Lincoln Parkway, west, from point northwest of Carnegie northwesterly toward Steubenville Pike, Allegheny Co., from Dravo, Inc., 331 Boquet St., Pittsburgh, $3,336,538 CD 4-27.

EARTHWORK, WATERWAYS

BIDS ASKED

† Montana—B.A. After 6/12—U. S. Eng., Fort Peck, flood protection works consisting channel improvement, riprap bank stabilization and levee on Sheridan, Richland and Daniels immediately upstream from U.S. Hy. 89 Bridge on Sheridan River, approx. 3.75 mi. south of Clyde Park. CIVENG 23-016-50-24.

† Colorado—B.A. 6/14—Bureau Reclamation, Dept. Interior, Bldg. 54, Denver Federal Center, Denver. Carter Lake Reservoir Colorado Big Thompson Proj., Spec. 5019. Extended date. CD 5-10.

† Colorado—B.A. 6/14—Bureau Reclamation, Dept. Interior, Bldg. 54, Denver Federal Center, Denver. Furnishing del. f.o.b. cars shipping point or f.o.b. cars Wells, Spec. Sec. 23,000 bbl. portland cement, Bid Item 2-A. Handling for 1 proj. west slope of Horsetooth Reservoir, approx. 3 mi. northwest of Fort Collins, Colo., connecting with Munroe Tunnel, approx. 4 mi. east of Loveland. Bid Item 2-B. Handling for 1 proj. west slope of Horsetooth Reservoir, approx. 3 mi. northwest of Fort Collins, Colo., connecting with Munroe Tunnel, approx. 4 mi. east of Loveland. Bid Item 2-C. Handling for 1 proj. Carter Lake Pressure Tunnel, Colorado-Big Thompson Proj., Spec. 2074. L. N. McClellan, engr.

† Illinois—B.A. 6/13—U. S. Eng., 808 U. S. Court House & Custom House, St. Louis 1, Mo., levees, Prairie Du Rocher, Illinois and vicinity, Edgar Lakes and Prairie Du Rocher and Modoc Drainage and Levee Dists., Proj. Item 2-A, Handling for 1 proj. west bank of Kaskaskia River, commencing approx. 1 mi. upstream from confluence with Mississippi River and extending approx. 4 mi. in a line about parallel to and about 1 mi. south of Chester, Ill. CIVENG 23-016-50-110. Extended date. CD 5-10.

† Michigan—B.A. 6/14—U. S. Eng., 2015 Cadillac Tower, Detroit 26, levee, flood protection works, [illegible] and storm sewer improvement [illegible] CIVENG 23-[illegible]

† Minn., Minneapolis—B.A. 6/13—U. S. Eng., 1217 Metropolitan Life Bldg., St. Paul, Proj. Zone 1, [illegible] CIVENG 23-018-50-57. CD 5-10.

O., Akron—B.A. 6/15—Dist. P. Wks., S. O. Lloyd, Akron Dam, Dam, Delta, Columbia, North St., retaining wall.

† Pennsylvania—B.A. 6/14—U. S. Eng., [illegible] improvements and [illegible] CIVENG 23-[illegible]

† Arkansas—B.A. 6/14—U. S. Eng., 302 Broadway, [illegible] CIVENG 23-[illegible]

† Arkansas—B.A. 6/14—U. S. Eng., [illegible] CIVENG 23-[illegible]

† Iowa—B.A. 6/14—U. S. Eng., [illegible] CIVENG 23-[illegible]

† Louisiana—B.A. 6/14—U. S. Eng., Port of Pittsburg, [illegible] CIVENG 23-[illegible]

† Louisiana—B.A. 6/14—U. S. Eng., Port of Pittsburg, [illegible] CIVENG 23-[illegible]

† Louisiana—B.A. 6/14—U. S. Eng., Port of Pittsburg, [illegible] CIVENG 23-[illegible]

La., Gretna—B.A. 6/14—Jefferson Parish Police Jury, Gretna, deepening Company Canal for 4,000 ft., Allen E. Holard, 2530 Amelia Ave., engr.

† Missouri—B.A. 6/14—U. S. Eng., 100 Broadway, Little Rock, Ark., [illegible] Clearwater

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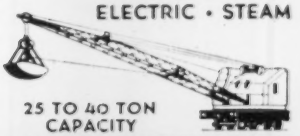

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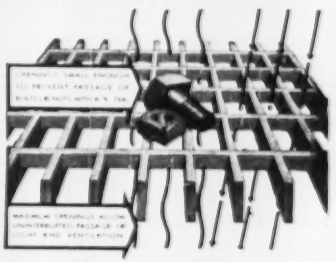

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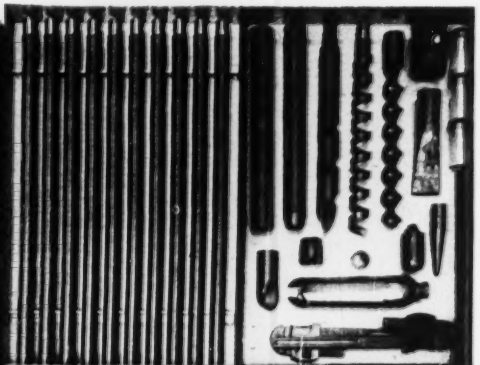

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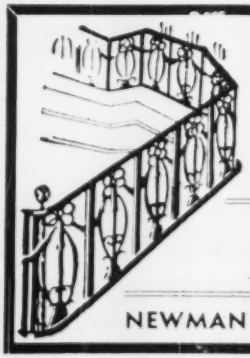

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† Virginia B.A. 6-15-50 U. S. Eng. foot of Front St. Norfolk, maintenance dredging Nansemond River, inv. Serial No. CIVENG 49-C-5-74 CD 6-21-49

† Washington B.A. 6-15-50 Bureau Reclamation, Dept. Interior, Ephrata, earthwork, earth membrane lining, pipe lines, structures Area W-4 Laterals and Sublaterals and Main Drains 645 Station 565 plus 00 to 856 plus 55; 645 W Station 0 to 336 plus 35 and 645 WN Station 0 to 80 plus 00, West Canal Laterals, inc. main drains, Columbia Basin Proj. Spec. 2497, extended date L. N. McClellan, dr engr CD 6-2-50

† Wash., Seattle B.A. 6-15-50 U. S. Eng. 4735 E. Marginal Way, Zone 4, reconstructing Portage Cut revetments, Lake Washington ship canal, Civ'Eng 50-80

† Colorado B.A. About 6-16-50 U. S. Eng. P. O. Box 2516, Albuquerque, N. M., Willow Creek Channel Improv., Station 29 plus 50 to Station 55 plus 00, Greene — Serial No. CIVENG 29-C-50-220 CD 4-21-50

† West Virginia and Ohio B.A. About 6-16-50 U. S. Eng. Madison Ave. and B St. W., Huntington 18, W. Va., installing mooring post above locks (all) on Locks and Dam 26, Ohio River along left descending bank at Mile 317.5 and Mile 317.7 W and about 1/2 mi. below Gallipolis, Ohio, Serial No. CIVENG 50-C-22-219

† Ky., Louisville B.A. 6-16-50 U. S. Eng. 830 W. Broadway, Louisville, Zone 3, 3 brick pumping plants, concrete substructures, concrete roof slab, one each 750 kva, 1500 kva, 3750 kva transformer substations, monolithic concrete sewers, etc., 27.1 ac. 34 St. and Bowman Park, J. L. Person, dist. engr.

† Ky., Louisville B.A. 6-16-50 U. S. Eng. 830 W. Broadway, Zone 3, steel concrete deck bridge, and approaches, 2 spans 150 ft. each, 1 span 100 ft., 1 span 75 ft., 1 span 50 ft.,

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† Montana ... $

† Oregon ...

▲† Texas ... Tuscahoma ...

LOW BIDDERS

▲† South Dakota ... $2,260,717

CD 5-26

▲† Wyoming and South Dakota ... $1,667,725

251: CD 4-24

CONTRACTS AWARDED

▲† Arizona ... $2,412,645

† Idaho ... $3,494,965

▲† North Dakota ... $9,748,245

LATIN AMERICA

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PUBLIC BUILDINGS

BIDS ASKED

▲ Fla., St. Petersburg ...

▲ Ark., Camden ...

▲ Ark., El Dorado ...

▲ Ark., Fort Smith ...

▲ Miss., Greenville ...

▲ Va., Petersburg ...

▲† N. M., Los Alamos ...

▲† N. M., Los Alamos ...

▲† N. M., Los Alamos ...

(Continued on page 103)

NEW!
MOTOR MOUNT
PUMPS
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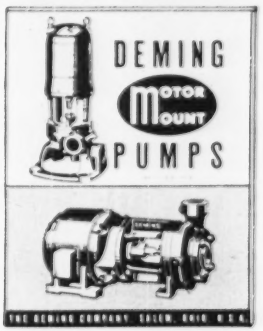

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GENERAL OFFICES • 1500 Union Commerce Building • CLEVELAND 14, OHIO

(Continued from page 101)

$1,000,000; $1,500,000. Plans depos. $50. Extended date. CD 5-18.

▲ Ont., London—SCHOOL—B.A. 6-17. Peter Schaefer, archt. 69 Edgar, London. 4 story, bsmt., 150 x 174 ft., brick, steel, concrete technical school addn., $1,000,000. CD 11-15.

▲ Pa., Farrington—HIGH SCHOOL—Bids Asked—Fernsbury Joint School Bd., James H. Fesenmyer, secy., R. D. Morrisville. High school, $1,378,000. A. E. Mikkelwright, 21 Ewing St., Trenton, N. J., archt. CD 4-21-49.

LOW BIDDERS

▲ Calif., Modesto—SCHOOL—Bd. Educ., 14 and E Sts., May 22. 2 story, reinforced concrete, 28 classroom, multi-purpose bldg., Downey High and Frank A. Fayle Jr. Junior High, Modesto. $1,011,950. CD 5-2.

▲ Mo., St. Louis—HOUSING—St. Louis Housing Auth., Arthur A. Brunsvold, pres., 10 S. Clark, exec. dir., 1220 Locust St., Zone 6. May 23. Two 14 story apartments of brick, steel bldgs., with area intended for commercial use on ground floor, 200 units, Cochran Gardens, Zone 7, and 9 units, Pruitt Igoe, Zone 3. Also 2 story, 24 unit, brick, steel bldg., Blumeyer Apts., Zone 10. $7,500,000. Bids 5-23. CD 4-21.

CONTRACTS AWARDED

▲ Md., Hagerstown—HOSPITAL—Washington Co. Hospital, Hagerstown. 8 story, reinforced concrete addition to Nicodemus Memorial Hospital. A. M. Strauss, archt. Approx. $1,500,000. Plans 4-25. awarded 5-23. CD 5-2 under LB.

▲ Mass., Taunton—SCHOOL—Commonwealth of Mass., Dept. Mental Health, 2 Ashburton Pl., Boston, architect for frame minded addns., alterations, Prog. 4-51. Cunha & Jo Quaker Bldg., Providence, R.I. $5,329,933. Bids 4-28. CD 4-4, under LB.

▲ O., Cambridge—HOSPITAL—Guern, Guernsey Co. Cambridge Guernsey Memorial Hospital, to Architects Constr. Co., 513 E. Tuscarawas St., Akron. Approx. $1,151,366. Bids 4-28. CD 4-4.

▲ O., Hamilton—HOSPITAL—Fitchen Hugh Memorial Hospital, Hamilton district hospital, to Hamilton Bldg. Co., 304 First Nat'l. Bank Bldg., $1,228,875. CD 2-28.

▲ R. I., Exeter—DORMITORIES—State of Rhode Island, F. A. Adams, 2d fl. opt. State House, Providence. May 24. Brick, steel, concrete mixed dormitory, Proj. No. 9170-41, Exeter School and Hospitals, and 1 story brick, steel, concrete female dormitory, Proj. 9170-42, from sketch P. Fayen, 26 Custom House St., Providence. $744,950 each. CD 5-16.

▲ Wash., Pullman—DORMITORY—Washington State College, Pullman, general contract 4 story women's dormitory, S. Symons & Son, 1932 Arnold St., Seattle. $1,370,051; mechanical work to H. D. Power, Moscow, Idaho, $283,388. CD 5-11.

COMMERCIAL BUILDINGS

BIDS ASKED

▲ Pa., New Kensington—HOSPITAL—B. A. 6-13—Citizens General Hospital, New Kensington, brick, steel frame hospital addn., $1,400,000. Ingham, Boyd & Pratt, Empire Bldg., Pittsburgh, archts. CD 8-27-47.

▲ N. Y., Kingston—HOSPITAL—B. A. 6-14—Our Lady of Victory Hospital, Kingston, Sacred Heart & St. Mary's Ave., $1,500,000. Henry J. Murphy, J. Harrison P. Brocker, archts.

▲ Pa., Harrisburg—HOSPITAL—B.A. 6-15—Harrisburg Hospital, Front and Mulberry Sts., general construction, heating, plumbing, electrical work, elevators for new bldg. and addns., alterations to Harrisburg Hospital, 4 new units, 1 story, 6 floors, Plans deposit $150. Lowe & Green, 121 N. Front St., Harrisburg, archts.

▲ Tex., Dallas—HOSPITAL—B.A. 6-21—St. Paul's Hospital, 2121 Bryan St., 6 story, bsmt., 55,000 sq. ft. hospital, altering existing unit, $1,700,000. Plans deposit $25. Mc. E. Kruger & H. W. Lanham, 2815 McKinney St., Houston, CD 11-14.

▲ Ill., Chicago—APARTMENT—Bids Asked—Louis R. Solomon, 63 N. Dearborn St., Zone 2. 17 story, 200 unit apartment, Lake Shore Dr. and Grande, 1410 Lake Shore Dr., $2,500,000. Louis R. Solomon & Assoc., 63 Superior St., archts.

SOON LETS CONTRACT

▲ Tenn., Nashville—GYMNASIUM—Vanderbilt U., Edgar Kiz, Nashville, soon lets contract gymnasium, $1,200,000. Edwin Keeble, Cotton States Bldg., archt. CD 4-20, under LB, archts.

▲ Wis., Milwaukee—HOSPITAL—St. Luke Hospital Assn., 2nd W. Michigan Sts., Zone 4, fireproof, reinforced concrete, 7 story, general hospital, steel sash, terrazzo floors, 2 story, general hospital, steel sash, terrazzo floors, 2 story, general hospital, steel sash, terrazzo floors, 2

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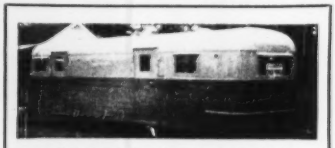

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Closets—Drawers—etc.

Price $2600.00 f.o.b. Baltimore

TRAILER VILLAGE, INC.
8645 Pulaski Highway, Baltimore 21, Md.
Phone: Essex 2233

Assn., 6118 Wilshire Blvd., Los Angeles. Approx. $2,649,000.

▲ Calif., Los Angeles—DWELLINGS—Clarmont Co., 374 Highland Ave., 226 frame, stucco dwellings to Harper Constr. Co., 734 N. Highland St., $1,608,000. Herman C. Light, 7551 Melrose Ave., archt.

▲ Calif., Los Angeles—STORE—Sears Roebuck & Co., 2650 E. Olympic Blvd., 2 story, 251x576 ft., brick concrete store to Haddock Eng. Ltd., 1616 S. Greenwood Ave., Montebello, $1,400,061. Bids 2/28. CD 3/6, under LB.

▲ Conn., Derby—HOUSING—Harold B. Yudkin, Sodom Lane, 35 single frame houses, Sodom Lane, Derby, builder, $2,500,000. CD 5/24.

▲ Ill., River Forest—CLASSROOMS, etc.—Rosary College, 7900 Division St., 4 story, basmt. classroom and auditorium, to W. J. Smith Bldg. Co., 14 La Salle St., Chicago. Zone 2, $1,200,000. Awarded 5/16. Hare & Hare, 147 E. 47th St., New York, N. Y., Zone 2, archts. J. L. McConnell & Assoc., 53 W. Jackson St., Chicago, Zone 4, engrs. CD 4/20/48.

▲ Ky., Louisville—HOUSES—Preston Corp., c/o David H. Wilson, pres., 1326 S. 7 St., 325 home sub-division on 226 acre tract, incl. 5 acre shopping and parking center, separate contracts, $2,000,000.

▲ Okla., Fort Sill—HOUSING—Fourth Army, headquarters, Fort Sam Houston, Tex., construct, manage and finance 600 unit housing to Hub H. & Assoc., Andrews Bldg., Dallas, Tex., Approx. $5,000,000. Contractor, J. W. Bateson Constr. Co., Irwin-Keeyer Bldg., Dallas, Tex., Awarded 5/12. Jos. H. Saylord, Neil P. Anderson Bldg., Fort Worth, Tex., archt. CD 4/19, under LB.

▲ Ore., Portland—APARTMENT—Vista View Co., Commerce Bldg., construct 12 story Vista St. Clair apartment at 22 and Vista Aves. and Park Ct. and Main St. to Smith Phillips, Board Trade Bldg., $2,877,260. Awarded 5/24. Victor A. Jones, Republic Bldg., Seattle, Wash., archt.

▲ Ont., Ottawa—APARTMENT BLOCKS—Alvin Enterprises Ltd., 3004 Sherbrooke St. W., Montreal, Que., twenty-nine 2 story, 28x107 ft., sixteen 2 story, 50x49 ft., six 2 story, 28x72 ft., all concrete brick veneer apartment blocks, Manor Park Extension, to Louis Donola, Inc., 4420 St. Lawrence Blvd., Montreal, Que., Approx. $2,000,000.

INDUSTRIAL BUILDINGS

BIDS ASKED

Ill., Chicago—WAREHOUSE—Bids 4/21—R. Cooper Jr. Co., 443 W. 47 St., Zone 32, 1 story brick, steel & concrete warehouse, for General Electric Co., 840 N. Lake Shore Dr., $500,000. A. Epstein & Sons Co., 201 W. Perning St., Zone 4, archts.

O., Youngstown—WAREHOUSE—Bids 4/and Truscon Steel, Albert St., 325 ft. x 65 ft., 1 story 100,000 sq. ft. steel storage warehouse for steel bldg. materials, materials fabricated in Truscon plant with brick facing in Willow St. south of Truscon's main plant, $300,000.

Wis., King—BOILER PLANT—Bids 4/and Wisconsin Grad Army Home for Veterans, King, boiler plant, $1,000,000. Mutty & Childs, 231 S. La Salle St., Chicago 4, Ill., engrs.

CONTRACTS AWARDED

▲ Ill., Chicago—BUS TERMINAL—Greyhound Corp., Clark and Randolph Sts., Zone 1, superstructure, bus terminal connecting through tunnel to lower level W. Wacker Dr., to John W. Harris Assoc., 134 N. La Salle St., Zone 3, and substructure to Hershy Mt. Construction, 74 W. Illinois St., Zone 10, $2,000,000. Skidmore Owings & Merrill, 200 W. Monroe St., Zone 3, archts. CD 3/3/49.

UNCLASSIFIED

CONTRACTS AWARDED

▲ Mass., Boston—PIERS—Port of Boston Auth., Commonwealth Pier 5, South Boston, Mystic Terminal, pier facilities, Piers 44 and 45, Northeast Channel to Chelsea Creek, Chapman & Scott Constr., 293 Pequot Ave., New London, Conn., $3,472,117. Bids 4/26. CD 5/1, under LB.

▲ N. C., Wilmington—WHARF, etc.—North Carolina State Ports Auth., Wilmington, reinforced wharf, dock to Diamond Constr. Co., 14 and O Sts., S.E., Wash., D. C., $1,901,369. Bids 5/9, awarded 5/23. CD 5/12, under LB.

▲ Texas—RAILWAY LINE—Gulf, Colorado & Santa Fe Ry., W. T. Carleton and Co., engr., Santa Fe Bldg., Galveston, Mar., 24.1 miles, 12.7 mi. standard gage main railway line between Kilgore and Bloomburg due to Wiley Dam and Reservoir Proj., from Guy H. Jones, 1918 Post Nat. Bank Bldg., Baltimore City, Md., $1,288,000. CD 4/20/48.

▲† Virginia—RAILWAY LINE—WATCH YARD—Va. & Ohio, Chesapeake & Ohio Ry., Richmond, construct new yard, Northern Neck Branch, Richmond to Newport News, Mine-mouth Co., Inc., Lewis Nos. 1 thru 4, 44,110,50.58, to Donovan Constr. Co., 1725 Carroll Ave. and Lovering Constr. Co., 616 Guardian Bldg., St. Paul, Minn., $4,257,992. Bids 4/27. CD 5/4, under LB.

▲ Ont., Toronto—SUBWAY—Toronto Transportation Comm., 35 King St., Contracts S-3, 4 and 5, St. Clair, Yonge Street Subways to Rayner Constr. Ltd., 179 Davenport Rd., Leaside, Approx. $7,000,000. Bids 5/16. CD 5/3.

Proposal Advertisements see pp. 105 to 109

U. S. Government

Department of Commerce, Bureau of Public Roads, May 25, 1950. SEALED BIDS will be received at the office of the Bureau of Public Roads, Acadia National Park Office, Bar Harbor, Maine, until 10:00 a.m., E.S.T., JUNE 20, 1950, for the construction of Project 10A1, Acadia National Park, Hancock County, Maine, reinforced Concrete Bridge with Stone Facing and Approaches, total length 284 miles. The approximate quantities of the more important items are as follows: 1,200 cu. yd. Excavation, 1,200 cu. yd. Cement Concrete, 240,000 lb. Reinforcing Steel and 1,040 cu. yd. Stone Masonry. Minimum wage rates have been fixed as required by law. Forms and specifications, a deposit of $10.00 each of certified check made payable to the Treasurer of the United States will be required to insure their return within 10 days after the opening of bids. Plans, specifications and proposal forms may be obtained from the Bureau of Public Roads office, c/o Acadia National Park Office, Bar Harbor, Maine, or 1916 Odgenlea Drive, Arlington, Virginia. H. J. Spelman, Division Engineer. (811)

OFFICIAL PROPOSALS

Bids: June 12, 1950 (811)

Furnishing and Delivering Cast Iron Soil Pipe and Fittings

WASHINGTON SUBURBAN SANITARY COMMISSION

SEALED PROPOSALS

Sealed proposals for furnishing and delivering 10,031 thousand (1,000) lb. Class "A" cast iron soil pipe, single hub, victory weight, three-thousand (3,000) lb. bench C.I. soil pipe, double hub, victory weight, fifteen-hundred (1,500) lb. bench C.I. soil pipe, single hub, victory weight, five-hundred (500) lb. each C.I. soil pipe double hub, victory weight, five-hundred (500) ea. 4-in. soil pipe "Y" branches, medium weight and five-hundred (500) ea. 4-inch soil pipe 1/8 bends, medium weight will be received in the office of the Purchasing Agent, Room 3, of the Washington Suburban Sanitary Commission, Hamilton Street, Hyattsville, Maryland until Monday, June 12th, 1950 at 10:00 A.M. Eastern Daylight Saving Time, at which time and place they will be publicly opened and read.

Specifications may be obtained from W. R. Douglas, Purchasing Agent of the Commission, Hyattsville, Maryland.

Dwight R. Gait, Chairman
Warren Browning
Leland G. Worthington
Commissioners

Bids: June 27, 1950 (816)

Elementary School

Contract No. E50-26

Sealed proposals will be received at the office of the Purchasing Agent, City of Hartford, Municipal Building, 550 Main Street, until 2 p.m. D.S.T., June 27, 1950 for:

Construction of an elementary school to be known as the Mary M. Hooker School, at Sheffield Avenue.

The bidder must file with his bid a certified check or bid bond for 5% of the total bid price, made payable to the City Treasurer of Hartford.

A satisfactory performance bond for 100% of the contract price will be required of the successful bidder.

Plans, specifications and blank forms of proposal may be obtained at the City Engineer's office, Municipal Building, on a deposit of $50.00 which will be refunded to the bidder who has submitted a bid and has returned the plans in good condition. $20.00 will be refunded to the bidder who has not submitted a bid but has returned the plans in good condition.

No bid may be withdrawn for a period of 30 days after the opening of bids without the approval and written consent of the City Manager.

The right is reserved to reject any and all bids not deemed to the best interest of the City.

CITY OF HARTFORD
By N. R. Hobson
PURCHASING AGENT

OFFICIAL PROPOSALS

Bids: June 26, 1950 (807)

Golf-Course Restaurant

THE PORT OF NEW YORK AUTHORITY
NEWARK AIRPORT

CONTRACT NA-28

Sealed proposals for the construction of the golf-course restaurant at Newark Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1306, 111 8th Ave., New York 11, N. Y., until 11:00 A.M. Monday, June 26, 1950, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Chief Engineer and copies will be furnished upon deposit of $10 per set. The deposit will be remitted if the documents are returned in good condition, not later than 30 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman.

New York, June 8, 1950.

Bids: June 19, 1950 (806)

Access Road to Golf Course

THE PORT OF NEW YORK AUTHORITY
NEWARK AIRPORT

CONTRACT NA-28

Sealed proposals for the construction of an access road to the golf course at Newark Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1306, 111 8th Ave., New York 11, N. Y., until 11:00 A.M. Monday, June 19, 1950, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Chief Engineer and copies will be furnished upon deposit of $10 per set. The deposit will be remitted if the documents are returned in good condition, not later than 30 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman.

New York, June 8, 1950.

Runway

Government of the Union of Burma proposes to build a new runway at Mingaladon Airport, Rangoon and request reputable firms of constructional engineers to submit proposals on the following basis:

One runway to conform to International Civil Aviation Organization specifications.

Two dimensions of runway are 9,000 feet x 200 feet with parallel taxitrack width 100 feet.

Three aircraft parking aprons 500 feet x 150 feet four inches thick and speed to be stressed to take aircraft of an all up weight of 150 tons.

The runway to be of concrete construction, asphalt covered.

Firms of construction engineers who are interested in the above project are requested to send representatives to Rangoon to view the site, to submit design specifications and draft agreements for the construction on a cost plus basis of contract. Firms proposing to send representatives are to cable The Director of Civil Aviation, Rangoon, Burma, stating date their representatives will arrive. All offers to be filed with Director of Civil Aviation within 28 days of the date of this advertisement.

Burmese Embassy.

(805)

Bids: June 19, 1950 (805)

Borings for Connections to New Jersey Turnpike

THE PORT OF NEW YORK AUTHORITY
LINCOLN TUNNEL, NEW JERSEY APPROACH

CONTRACT LT-11

Sealed proposals for making borings relative to the Connections to the New Jersey Turnpike from the Lincoln Tunnel will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1306, 111 8th Ave., New York 11, N. Y., until 11:00 A.M. Monday, June 19, 1950, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Chief Engineer, and copies will be furnished upon deposit of $10 per set. The deposit will be remitted if the documents are returned in good condition, not later than 30 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman.

New York, June 8, 1950.

Bids: June 20, 1950 (808)

Substructure

Sealed proposals will be publicly opened and read by the Jones Beach State Parkway Authority at Administration Headquarters, Belmont Lake State Park, Babylon, New York, on Friday, June 30, 1950 at 2:00 P.M. Eastern Daylight Saving Time, for furnishing the necessary labor, material and equipment for and incidental to Contract No. 2, construction of the substructure of the proposed Captree State Parkway bridge and trestle across Great South Bay east of Babylon, Long Island and the substructure of the proposed bascule bridge across the State Boat Channel at Captree Island, Suffolk County, New York, as shown on the Plans and in accordance with the Contract Special Conditions and Specifications and as directed by the Engineer. Final award will be made on the basis of the lowest total sum bid, which shall be the amount of the summation of the products of the quantities multiplied by the unit price bid.

Proposal forms, specifications and plans may be viewed and obtained at the office of the Jones Beach State Parkway Authority, Belmont Lake State Park, Babylon, New York and at the office of Hardesty & Hanover, Consulting Engineers, 101 Park Avenue, New York City. A certified check for approximately 1% percent of the bid in accordance with a schedule given in the contract documents, must accompany each bid.

A fee of $10.00 for each set of plans and proposal forms will be required. No refund will be made for the return of the plans. The Jones Beach State Parkway Authority reserves the right to reject any or all bids. Contractors wishing to examine the site of the proposed work may obtain the services of a boat free of cost by getting in touch with the Engineering Department, Long Island State Park Commission, telephone Babylon 1000.

Bids: June 14, 1950 (798)

Furnishing and Delivering 24" Cast Iron Pipe

WASHINGTON SUBURBAN SANITARY COMMISSION

SEALED PROPOSAL

Sealed proposals for furnishing and delivering fifteen-hundred (1,500) lineal feet of 24-inch cast iron pipe, Class 150 Cement Lined Joint & Spigot will be received in the office of the Purchasing Agent, Room 3, 4017 Hamilton Street, Hyattsville, Maryland until 10:00 A.M. Eastern Daylight Saving Time, Wednesday, June 14, 1950, at which time and place they will be publicly opened and read.

Specifications may be obtained from W. R. Douglas, Purchasing Agent of the Commission, Hyattsville, Maryland.

Dwight R. Gait, Chairman
Warren Browning
Leland G. Worthington
Commissioners

(Continued on page 106)

CONTRACTORS WATCH THIS SECTION

for New Projects

Publish your announcements thru the "Proposal Section" of Engineering News-Record and get their bids.

U. S. Government
(Continued from page 105)

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. 2660) will be received by Bureau of Reclamation, Ephrata, Washington, June 22, 1950, and then publicly opened for furnishing labor and materials and performing all work for the construction of earthwork, asphaltic membrane lining, pipe lines, and structures, area W-3 laterals and sublaterals and sublaterals, lateral W22, Station 14+09.22 to Station 134+70; and sublateral W22E, Station 0+00 to Station ++++.80, West Canal laterals, Columbia Basin Project, Washington. The work is situated about 5 miles southeast of Ephrata, Washington. Principal items are approximately 100,000 cu. yds. asphalt for membrane lining, 100 tons, concrete, 400 cu. yds.; gates and metalwork, 26,000 lbs.; 12,400 lin. ft. of 78-in. and 66-in precast concrete pipe or 8,000 cu. yds. concrete for siphon; and other work. Time allowed for completion will be 400 days. For particulars, address Bureau of Reclamation, Ephrata, Washington, or Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner.
(3981)

Office of the District Engineer, Corps of Engineers, U. S. Army, 1217 U. S. Post Office and Custom House, St. Paul 1, Minnesota. Sealed bids in duplicate, for furnishing all labor and material and performing all work required for Channel Improvement on Wild Rice River, Minnesota, will be received in this office until 11:00 A.M., CST, June 15, 1950 and then publicly opened. Further information upon application.

(3788)

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation, sealed bids (Specification No. 26721) will be received by Bureau of Reclamation, Rock Springs, Wyoming, June 28, 1950 and then publicly opened for furnishing labor and materials and performing all work for the construction of Big Sandy Dam and Dike, Eden Project, Wyoming. The work is situated on the Big Sandy Creek about 14 miles north of Eden, Wyoming. Principal items are approximately excavation, 1,230,000 cu. yds.; fill, 787,000 cu. yds.; riprap, 47,250 cu. yds.; 2 reinforcing sewer pipe, 2,064 lin. ft.; concrete, 3,150 cu. yds.; installing metalwork, 87,800 pounds; and other work. Time allowed for completion will be 500 days. For particulars address Bureau of Reclamation, Rock Springs, Wyoming, or Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner.
(3814)

OFFICIAL PROPOSALS

Bids June 21, 1950 (3661)

State Road Work

Sealed proposals will be received by the State Highway Department at its offices in Dover, Delaware, until 2:00 P. M. E.D.S.T., 2:00 P. M. E.S.T., June 21, 1950, and at that time and place publicly opened for contracts involving the following approximate quantities:

CONTRACT 1642
Federal Aid Project S-8(4)
LAUREL TO SEAFORD
Sussex County

C. C. Widening & Hot Mix Resurface 24.
9.565 Miles
9,000 C. Y. Excavation
1,000 C. Y. Structure Excavation
1,500 C. Y. Borrow
7,000 C. Y. Borrow Pit Stripping
2,500 C. Y. Selected Borrow
2,450 C. Y. C. C. Base
15,500 T. Hot Mix Asphalt
1,250 S. Y. Patching
62 M.F.B.M. Plain Timber Structures
30 C. Y. C. C. Masonry
2,200 Lb. Reinforcing Steel
250 L. F. 12" R. C. Pipe
250 L. F. 15" R. C. Pipe
200 L. F. 18" R. C. Pipe
120 L. F. 24" R. C. Pipe
15 L. F. 30" R. C. Pipe
400 L. F. 12" Conc. Sewer Pipe
100 L. F. 15" Conc. Sewer Pipe
1,850 L. F. 18" Conc. Sewer Pipe
60 L. F. 8" Corr. Metal Pipe
20 L. F. 6" Vit. Clay Pipe
50 L. F. 8" Vit. Clay Pipe
15 L. F. 10" Vit. Clay Pipe
120 L. F. Timber Piles
50 L. F. Timber Test Piles
2 M.F.B.M. Sheet Piles
20 S. Y. Cement Concrete Gutter
500 L. F. 6" Cement Concrete Curb
5,600 L. F. 8" Cement Concrete Curb
2,600 S. F. 4" Cement Concrete Sidewalk
1,000 S. F. 6" Cement Concrete Sidewalk
500 L. F. Wood Shoulder Curb
34 Each Catch Basins (Type "B")
22 Each Adjusted Catch Basins
7 Each Manholes
4 Each Adjusted Manholes
22,500 Lb. Cribbing
500 L. F. Wire Rope Guard Fence
8 Each End Post Attachments
970 S. Y. Topsoil
0.5 A. Seeding
17,000 S. Y. Sodding
4,100 Gal. R. C. 1 Asphalt
5,100 Gal. R. C. 2 Asphalt
150 T. Slag Chips
120 T. Crushed Chips
1 Each Drainage Wells
500 T. Sand
1,500 L. F. Ditching
3 Each Adjusted Water Valves

CONTRACT 1643-A
Federal Aid Project S-S-T (2)
SEAFORD BRIDGE REFLOORING
Sussex County

Open Mesh Steel Flooring 0.028 Miles
70 T. Hot-Mix Asphalt
2.5 M.F.B. Creo. Timber Structures
2.5 C. Y. Cement Concrete Masonry
17,000 Lb. Structural Steel
1,200 S. F. 2½ Open Mesh Steel Floor
110 L. F. 2 Pipe Railing

CONTRACT 1672
Federal Aid Project F-152 (2)
MIDDLETOWN TO ODESSA
New Castle County

Hot-Mix Asphalt Pavement on W. B. Macadam Base - 2.270 Miles
32,000 C. Y. Excavation
150 C. Y. Structure Excavation
1,000 C. Y. Borrow Pit Stripping
27,000 C. Y. Selected Borrow
15,000 T. Waterbound Macadam
8,100 T. Hot-Mix Asphalt
500 S. Y. Cement Concrete Pavement
500 S. Y. Patching
35 C. Y. Cement Concrete Masonry
5,000 Lb. Reinforcing Steel
150 Sq. Yds. Wire Mesh Reinforcement
800 L. F. 12" R. C. Pipe
600 L. F. 15" R. C. Pipe
270 L. F. 18" R. C. Pipe
50 L. F. 21" R. C. Pipe
72 L. F. 24" R. C. Pipe
175 L. F. 30" R. C. Pipe
175 L. F. 30" Metal Pipe
60 L. F. 8" Vit. Clay Pipe
87 M.Ft. Creo. Sheet Piles
16 S. Y. Cement Concrete Gutter
1,500 L. F. Cement Concrete Curb
2,450 S. F. Cement Concrete Sidewalk
1,500 L. F. Wood Shoulder Curb
2 Each Catch Basins (Type "B")
1 Each Catch Basin (Type "C")
1 Each Manholes
10,500 Lb. Cribbing
1,000 L. F. Wire Rope Guard Fence
8 Each End Post Attachments
17,000 S. Y. Sodding
2,000 Gal. R. C. 1 Asphalt
2,000 Gal. R. C. 2 Asphalt
50 T. Crushed Slag
50 T. Crushed Chips
200 T. Quarry Screenings
2,450 S. Y. Removal Present Pavement
700 L. F. Hot-Mix Walk
1 Adjustable Base Box
240 Each Bags Extra Concrete
10 T. Calcium Chloride
50 T. Sand
1,500 L. F. Ditching

CONTRACT 1670
Federal Aid Project S-151 (1)
SILVER LAKE ROAD
New Castle County

20' Stabilized & Surface Treated Road - 0.1 Miles
17,000 C. Y. Excavation
50 C. Y. Structure Excavation
100 C. Y. Borrow Pit Stripping
1,000 C. Y. Selected Borrow
30 C. Y. Cement Concrete Masonry
2,000 Lb. Reinforcing Steel
150 L. F. 12" R. C. Pipe
50 L. F. 15" R. C. Pipe
50 L. F. 18" R. C. Pipe
200 L. F. 30" R. C. Pipe
200 L. F. 30" Metal Pipe
1.5 M.F.B. Untreated Sheet Piles
1,100 L. F. Wood Shoulder Curb
1,100 L.F. Wire Rope Guard Fence
16 Each End Post Attachments
2,600 S. Y. Sodding
2,000 Gal. R. C. 1 Asphalt
2,000 Gal. R. C. 2 Asphalt
250 T. Slag Chips
250 T. Crushed Chips
50 T. Riprap
Removal & Reconstruction of Gates

These Contracts are Federal Aid Projects and will be governed by the provisions of the Federal Aid Highway Act as amended.

The Employment Agency for these contracts shall be the Delaware State Employment Service whose offices are located at 601 Shipley Street, Wilmington, Delaware, and the Wagamon Building, The Circle, Georgetown, Delaware.

Attention is called to the Special Provisions in the proposal, specifications and contract agreement.

Performance of contract shall commence within ten (10) days after the execution of the contract and be completed as specified.

Monthly payments will be made for ninety (90) per cent of the construction completed each month.

Bidders must submit proposals upon forms provided by the Department.

Each proposal must be accompanied by a surety bond, certified check or money to the amount of at least ten (10) per centum of the total amount of the proposal.

The envelope containing the proposal must be marked "Proposal for the construction of State Highway Contract No. ...."

The right is reserved to reject any or all bids.

The contract will be awarded or rejected within twenty (20) days from the date of opening proposals.

Complete sets of plans and specifications may be obtained after June 5, 1950, upon receipt of five dollars ($5.00) for each contract, which amount will not be refunded.

Make checks payable to the State Highway Department.

STATE HIGHWAY DEPARTMENT
By J. Gordon Smith, Chairman
M. Allan Wilson, Chief Engineer
Dover, Delaware
May 22, 1950

Bids July 14, 1950 (3744)

Sewage Treatment Plant

BETHLEHEM, PA.
NOTICE TO BIDDERS
GENERAL CONSTRUCTION

Contract No. 1

Sealed proposals addressed to the Bethlehem Authority at City of Bethlehem, Pa. for "General Construction" of a Sewage Treatment Plant, will be received at the office of the Bethlehem Authority, 528 N. New St., Bethlehem, Pa. until 9:00 A.M. Eastern Standard Time on the 14th day of July 1950 at which time and place they will be publicly opened and read.

Plans and specifications, form of contract and bidding blanks are on file and may be obtained at the office of the Bethlehem Authority, 528 N. New St., Bethlehem, Pa. by making up a bid by depositing $50.00 which amount will be refunded if a bid is submitted and the plans are returned in good condition. In case no bid is submitted $15.00 will be refunded if said plans and specifications are returned in good condition within two weeks of the date set for the receiving of bids by the Authority.

No bidder will be permitted to withdraw his bid for a period of thirty (30) days after the date set for the opening of the bids.

The Bethlehem Authority reserves the right to waive any informality in any bid or to reject any or all proposals or to accept any bid deemed advisable for the best interests of the City of Bethlehem, Pennsylvania.

Each proposal shall be accompanied by a Certified Check, Bank Treasurer's Check or Cashier's Check, in an amount equal to at least to three (3) per cent of the total of the bid submitted drawn to the order of the Bethlehem Authority, Bethlehem, Pennsylvania. The bidder to whom a contract is awarded will be required to furnish for the faithful performance of the work under this contract, an approved Surety Company Performance Bond in an amount equal to ten per cent of the total of the bid as submitted and a separate Surety Company Labor and Materialmen's Bond in an amount equal to ten per cent of the total of the bid submitted.

Bethlehem Authority
Bethlehem, Pennsylvania
By: W. R. Coyle, Chairman
Robert L. Fox
Executive Director

(Continued on page 107)

OFFICIAL PROPOSALS

(Continued from page 106)

Bids: June 22, 1950 (779)

Water Distribution & Sanitary Sewerage System & Plant

Sealed proposals will be received by the Hummels Wharf Municipal Authority, at Monroe Township Consolidated School, Hummels Wharf, Snyder County, Pennsylvania, until 8:00 o'clock P.M. (Eastern Daylight Saving Time) on Thursday, June 22, 1950, at which time and place the bids will be publicly opened and read aloud, for the Construction of Water Distribution System, Sanitary Sewerage System and Sewage Treatment Plant. Copies of the Plans, Specifications and other Contract Documents can be obtained from Richard J. Harman, Consulting Engineer, 222 North Third Street, Harrisburg, Pennsylvania, upon a deposit of $20.00 for each set of documents. If the documents are returned in good condition within five (5) days after the opening of the bids, one half amount ($15.00) of the deposit for one set will be refunded. If the documents are not returned within the time stated, the entire amount of the deposit will be forfeited. A certified check in the amount of $12,000.00 must be submitted with the proposal as bid security. No bid may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

The Hummels Wharf Municipal Authority of Hummels Wharf reserves the right to waive any informalities in or reject any or all bids.

Leon N. Messner, Secretary
Hummels Wharf Municipal Authority
Hummels Wharf, Pennsylvania

Bids: July 14, 1950 (778)

Plumbing

BETHLEHEM, PA.

NOTICE TO BIDDERS

Contract No. 5

Sealed proposals addressed to the Bethlehem Authority of the City of Bethlehem, Pa., for "Plumbing" for Sewage Treatment Plant, will be received at the office of the Bethlehem Authority, 528 N. New St., Bethlehem, Pa. until 9:00 A.M., Eastern Standard Time on the 14th day of July 1950. At which time and place they will be publicly opened and read.

Plans and specifications, form of contract and bidding blanks are on file and may be obtained at the office of the Bethlehem Authority, 528 N. New St., Bethlehem, Pa. for use in making up a bid by depositing $15.00 which amount will be refunded if a bid is submitted and the plans are returned in good condition. In case no bid is submitted, $10.00 will be refunded if said plans and specifications are returned in good condition within two weeks of the date set for the receiving of bids by the Authority.

No bidder will be permitted to withdraw his bid for a period of thirty (30) days after the date set for the opening of the bids.

The Bethlehem Authority reserves the right to waive any informality in any bid, to reject any or all proposals or to accept any bid deemed advisable for the best interests of the City of Bethlehem, Pennsylvania.

Each proposal shall be accompanied by a Certified Check, Bank Treasurer's Check or Cashier's Check, in an amount equal at least to five (5) per cent of the total of the bid submitted, drawn to the order of the Bethlehem Authority, Bethlehem, Pennsylvania. The bidder to whom a contract is awarded will be required to furnish for the faithful performance of the work under this contract, an approved Surety Company Performance Bond in an amount equal to 100 per cent of the total of the bid as submitted and a separate Surety Company Labor and Materialmen's Bond in an amount equal to 50 per cent of the total of the bid submitted.

Bethlehem Authority
Bethlehem, Pennsylvania
By: W. R. COYLE, CHAIRMAN
ROBERT L. FOX, Executive Director

OFFICIAL PROPOSALS

Bids: July 14, 1950 (777)

Heating and Ventilating

BETHLEHEM, PA.

NOTICE TO BIDDERS

Contract No. 4

Sealed proposals addressed to the Bethlehem Authority of the City of Bethlehem, Pa., for "Heating and Ventilating" for Sewage Treatment Plant, will be received at the office of the Bethlehem Authority, 528 N. New St., Bethlehem, Pa. until 9:00 A.M., Eastern Standard Time on the 14th day of July 1950. At which time and place they will be publicly opened and read.

Plans and specifications, form of contract and bidding blanks are on file and may be obtained at the office of the Bethlehem Authority, 528 N. New St., Bethlehem, Pa. for use in making up a bid by depositing $15.00 which amount will be refunded if a bid is submitted and the plans are returned in good condition. In case no bid is submitted, $10.00 will be refunded if said plans and specifications are returned in good condition within two weeks of the date set for the receiving of bids by the Authority.

No bidder will be permitted to withdraw his bid for a period of thirty (30) days after the date set for the opening of the bids.

The Bethlehem Authority reserves the right to waive any informality in any bid, to reject any or all proposals or to accept any bid deemed advisable for the best interests of the City of Bethlehem, Pennsylvania.

Each proposal shall be accompanied by a Certified Check, Bank Treasurer's Check or Cashier's Check, in an amount equal at least to five (5) per cent of the total of the bid submitted, drawn to the order of the Bethlehem Authority, Bethlehem, Pennsylvania. The bidder to whom a contract is awarded will be required to furnish for the faithful performance of the work under this contract, an approved Surety Company Performance Bond in amount equal to 100 percent of the total of the bid as submitted and a separate Surety Company Labor and Materialmen's Bond in an amount equal to 50 per cent of the total of the bid submitted.

Bethlehem Authority
Bethlehem, Pennsylvania
By: W. R. COYLE, CHAIRMAN
ROBERT L. FOX, Executive Director

Bids: July 15, 1950 (776)

Electric Power, Control and Lighting System

BETHLEHEM, PA.

NOTICE TO BIDDERS

Contract No. 3

Sealed proposals addressed to the Bethlehem Authority of the City of Bethlehem, Pa. for "Electric Power, Control and Lighting System" for Sewage Treatment Plant, will be received at the office of the Bethlehem Authority, 528 N. New St., Bethlehem, Pa. until 9:00 A.M., Eastern Standard Time on the 14th day of July 1950. At which time and place they will be publicly opened and read.

Plans and specifications, form of contract and bidding blanks are on file and may be obtained at the office of the Bethlehem Authority, 528 N. New St., Bethlehem, Pa. for use in making up a bid by depositing $15.00 which amount will be refunded if a bid is submitted and the plans are returned in good condition. In case no bid is submitted, $10.00 will be refunded if said plans and specifications are returned in good condition within two weeks of the date set for the receiving of bids by the Authority.

No bidder will be permitted to withdraw his bid for a period of thirty (30) days after the date set for the opening of the bids.

The Bethlehem Authority reserves the right to waive any informality in any bid, to reject any or all proposals or to accept any bid deemed advisable for the best interests of the City of Bethlehem, Pennsylvania.

Each proposal shall be accompanied by a Certified Check, Bank Treasurer's Check, or Cashier's Check, in an amount equal at least to five (5) per cent of the total of the bid submitted, drawn to the order of the Bethlehem Authority, Bethlehem, Pennsylvania. The bidder to whom a contract is awarded will be required to furnish, for the faithful performance of the work under this contract, an approved Surety Company Performance Bond in an amount equal to 100 per cent of the total of the bid as submitted and a separate Surety Company Labor and Materialmen's Bond in an amount equal to 50 per cent of the total of the bid submitted.

Bethlehem Authority
Bethlehem, Pennsylvania
By: W. R. COYLE, CHAIRMAN
ROBERT L. FOX, Executive Director

OFFICIAL PROPOSALS

Bids: July 14, 1950 (775)

Pumping Equipment

BETHLEHEM, PA.
NOTICE TO BIDDERS
SEWAGE TREATMENT PLANT

CONTRACT NO. 2

Sealed proposals addressed to the Bethlehem Authority of the City of Bethlehem, Pa., for "Sewage Pumping Equipment and Appurtenances for Sewage Treatment Plant, will be received at the office of the Bethlehem Authority, 528 N. New St., Bethlehem, Pa. until 9:00 A.M. Eastern Standard Time on the 14th day of July 1950. At which time and place they will be publicly opened and read.

Plans and specifications, form of contract and bidding blanks are on file and may be obtained at the office of the Bethlehem Authority, 528 N. New St., Bethlehem, Pa. for use in making up a bid by depositing $15.00 which amount will be refunded if a bid is submitted and the plans are returned in good condition. In case no bid is submitted, $10.00 will be refunded if said plans and specifications are returned in good condition within two weeks of the date set for the receiving of bids by the Authority.

No bidder will be permitted to withdraw his bid for a period of thirty (30) days after the date set for the opening of the bids.

The Bethlehem Authority reserves the right to waive any informality in any bid, to reject any or all proposals or to accept any bid deemed advisable for the best interests of the City of Bethlehem, Pennsylvania.

Each proposal shall be accompanied by a Certified Check, Bank Treasurer's Check, or Cashier's Check, in an amount equal at least to five (5) per cent of the total of the bid submitted, drawn to the order of the Bethlehem Authority, Bethlehem, Pennsylvania. The bidder to whom a contract is awarded will be required to furnish, for the faithful performance of the work under this contract, an approved Surety Company Performance Bond in an amount equal to 100 per cent of the total of the bid as submitted and a separate Surety Company Labor and Materialmen's Bond in an amount equal to 50 per cent of the total of the bid submitted.

Bethlehem Authority
Bethlehem, Pennsylvania
By: W. R. COYLE, CHAIRMAN
ROBERT L. FOX, Executive Director

U. S. Government

NEW ORLEANS DISTRICT, CORPS OF ENGINEERS, Foot of Prytania Street, New Orleans, La. Sealed bids will be received in the office of the undersigned until July 11, 1950, and then opened for the construction of superstructure of gated portion of Morganza Control Structure, in the New Orleans District. The principal features involved are approximately 120,000 cubic yards concrete, 14,000,000 lbs. reinforcing steel, 12,500 lbs. Portland cement, 350,000 lbs. structural steel, 245,000 lbs. corrosion-resisting steel, and miscellaneous other work including excavation and backfill, drainage system, and installation of 127 steel gates. Further information on application. (6x6)

(Continued on page 108)

OFFICIAL PROPOSALS
(Continued from page 107)

Bids: June 14, 1950 (7373)

Trunk Line Sewers

BETHLEHEM, PA.

Sealed proposals addressed to the Bethlehem Authority of the City of Bethlehem, Pa., for the construction of Trunk Line Sewer Sections 1, 2, 3, 4 and 5 will be received at the office of the Bethlehem Authority, 528 N. New St., Bethlehem, Pa., until 1:00 P.M. Eastern Standard Time, on the 14th day of July, 1950 at which time and place they will be publicly opened and read.

Plans and specifications, form of contract and bidding blanks are on file and may be obtained at the office of the Bethlehem Authority, 528 N. New St. Bethlehem, Pa., for use in making up a bid by depositing $15.00 which amount will be refunded if a bid is submitted and the plans are returned in good condition. In case no bid is submitted, $10.00 will be refunded if said plans and specifications are returned in good condition within two weeks of the date set for the receiving of bids by the Authority.

No bidder will be permitted to withdraw his bid for a period of thirty (30) days after the date set for the opening of the bids.

The Bethlehem Authority reserves the right to award a separate contract on each Section, to waive any informality in any bid, to reject any or all proposals or to accept any bid deemed advantageous to the best interests of the City of Bethlehem, Pennsylvania.

Each proposal shall be accompanied by a certified check, Treasurer's check, or Cashier's check, in an amount equal at least to five (5) percent of the total of the bid submitted, drawn to the order of the Bethlehem Authority, Bethlehem, Pennsylvania. The bidder to whom a contract is awarded will be required to furnish for the faithful performance of the work under this contract an approved Surety Company Performance Bond in an amount equal to 100 percent of the total of the bid as submitted and a separate Surety Company Labor and Materialmen's Bond in an amount equal to 50 percent of the total of the bid submitted.

Approximate Quantities
14,300 linear feet 8" to 15" sewer
11,500 linear feet 18" to 42" sewer
3 Inverted Siphons
4 Railroad Tunnels and appurtenances
Bethlehem Authority
Bethlehem, Pennsylvania
By W. R. Coyle, Chairman
Robert L. Fox
Executive Director

Bids: June 27, 1950 (7340)

Alterations & Additions to Schools

THE BOARD OF EDUCATION OF
CENTRAL SCHOOL DISTRICT NO. 1
TOWNS OF TUSTEN AND CochECTON
SULLIVAN COUNTY, NEW YORK
OWNER

separate sealed bids for General Contractor Work, Heating and Ventilating Work, Plumbing Work and Electrical Work for the Alterations and Addition to the Narrowsburg Central School, Narrowsburg, New York will be received by the Board of Education of Central School District No. 1, Towns of Tusten and Cochecton, Sullivan County, New York at the office of the Board of Education of the School District at Narrowsburg, New York, until 2:00 P.M. Eastern Daylight Saving Time, June 27, 1950, and then at said place publicly opened and read aloud.

The Information for Bidders, Proposal Forms, Contract, Plans, Specifications and Forms of Bid Bond and Performance Bond may be examined at the office of the Board of Education, Narrowsburg, New York and at the office of H. G. Pulleyn, Architect, 1 Washington Ave., Ithaca, N.Y. and copies thereof obtained at said Architect's office upon payment of $5.00 for each set. Any bidder upon returning said set promptly and in good condition will be refunded his payment, and non-bidders upon returning such set will be refunded $3.00. The Board of Education reserves the right to waive any informalities in or to reject any or all bids.

OFFICIAL PROPOSALS

Each bidder must deposit with his bid security in an amount of not less than five percentum (5%) of the Base Bid in the form and subject to the conditions provided in the Information for Bidders.

Attention of bidders is particularly called to the requirement as to minimum wage rates to be paid under the contracts.

No bidder may withdraw his bid within forty-five (45) days after the actual date of the opening thereof.

CHARLES J. MAAS
President, Board of Education

June 1 and 8, 1950

Bids: June 20, 1950 (7311)

Structures, Grading, Drainage & Paving

PENNSYLVANIA TURNPIKE
COMMISSION

Harrisburg, Pennsylvania

NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission, through the Chairman, 11 North Fourth Street, Harrisburg, Pennsylvania, until 10:00 A.M. (Eastern Daylight Saving Time), the 20th day of June, 1950, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room No. 1, North Office Building, State Capitol, Harrisburg, Pennsylvania, and immediately publicly opened and read aloud, for the following contract:

For the construction of structures and the grading, drainage and paving of Turnpike Section 31A, part of the Western Pennsylvania Turnpike Extension in Indiana and Harmar Townships, Allegheny County, Commonwealth of Pennsylvania. This section being situated as follows:

Beginning at a point approximately 900 feet East of Township Road 587 in Indiana Township at Turnpike Station 864+26 in Allegheny County, thence in an Easterly direction 11,435 feet to a point on the right descending bank of the Allegheny River, Harmar Township, at Turnpike Station 1056+61 on the Turnpike Centerline, Allegheny County, a distance of approximately 2.21 miles.

The approximate quantities of the principal items are as follows:

Class 1 Excavation, 1,139,500 cubic yards; Class 2 Excavation, 22,700 cubic yards; Borrow Excavation, 525,500 cubic yards; Reinforced Concrete Pavement, 111,500 cubic yards; Class A Concrete, 7,450 cubic yards; Class B Concrete, 7,450 cubic yards; Steel Reinforcing Bars, 740,000 pounds; Fabricated Structural Steel, 2,931,000 pounds.

Copies of plans, specifications, and other contract documents, including cross-sections are on file and open to public inspection at the offices of the Pennsylvania Turnpike Commission, located at Harrisburg, Pennsylvania, on and after June 8, 1950. Plans, specifications, cross-sections and other contract documents will not be available before this date for inspection or for mailing to prospective bidders. Copies of specifications for grading, drainage, paving and structures may be purchased from the Pennsylvania Turnpike Commission for the sum of $50 (48 sets of these specifications are available). Copies of cross-sections may be obtained from the Pennsylvania Turnpike Commission for the sum of ten dollars ($10.00) per set, for each section.

Plans and contract documents for this section, exclusive of cross-sections and specifications, may be obtained from the Commission, upon deposit of ten ($10.00) dollars for each set, such deposits to be refunded in full to any actual bidder upon return of plans, documents and good condition, within ten days after the date of the opening of the bids. Refund will be made for all plans, contract documents, and cross-sections returned, if the project is withdrawn from letting by the Pennsylvania Turnpike Commission. Deposits are payable to the Pennsylvania Turnpike Commission, and should accompany requests for drawings, specifications, contract documents, and cross-sections.

The character and amount of bid security required of the bidder is stated in the Instructions to Bidders.

OFFICIAL PROPOSALS

The Commission reserves the right to waive any informalities in or to reject any or all bids.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

PENNSYLVANIA TURNPIKE
COMMISSION
James F. Torrance
Secretary and Treasurer
Harrisburg, Pennsylvania
May 24, 1950

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation, Sealed bids (Specifications No. 30084) will be received by Bureau of Reclamation, Ephrata, Washington, June 23, 1950, and then publicly opened for furnishing labor and materials and performing all work for the construction of earthwork and structures, Stations 455+57 to Station 527+50, Potholes East Canal, and North Scooteney dike, Columbia Basin Project, Washington. The work is situated near Othello, Washington. Principal items are approximately 4,264,550 cu. yds. excavation, rock and common; 4,995 barrels, furnishing and handling cement; 445,000 pounds, furnishing and placing reinforcement bars; 2,850 M.b.m., furnishing and erecting timber, treated and untreated; 280,000 pounds, furnishing and driving steel sheet piling; and other work. Time allowed for completion will be 700 days. For particulars, address Bureau of Reclamation, Ephrata, Washington, and Bidding Room 1A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner.
(7309)

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation, Sealed bids (Specifications No. 30064) will be received by Bureau of Reclamation, Bismarck, North Dakota, June 22, 1950, and then publicly opened for furnishing labor and materials and performing all work for the construction of Bismarck-Dawson-Jamestown 230-kilovolt transmission lines, Missouri River Basin Project. The work is situated between Bismarck, Dawson and Jamestown, North Dakota. The work will consist of constructing foundations, erecting steel towers, and stringing 3 conductors and 2 overhead ground wires for a total distance of approximately 95 miles. Time allowed for completion will be 470 days. For particulars, address Bureau of Reclamation, Bismarck, North Dakota; or Building 1A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner.
(7309)

(Continued on page 194)

Official Proposals Columns of
ENGINEERING NEWS-RECORD

are MUST reading, each week for contractors, engineering-construction companies, equipment and materials manufacturers, all over the United States and used regularly for over 50 years by government, state, county and municipal departments to advertise bids.

Official Proposal Division

Engineering News-Record
330 West 42nd St.
New York 18, N. Y.

OFFICIAL PROPOSALS
(Continued from page 108)

Bids: July 13, 1950 (7923)

Senior High School and Recreational Facilities

TOWN OF EAST PROVIDENCE,
RHODE ISLAND

Sealed bids for the construction of the 1,500 pupil SENIOR HIGH SCHOOL AND RECREATIONAL FACILITIES IN THE TOWN OF EAST PROVIDENCE, RHODE ISLAND, will be received at the office of the Superintendent of Schools, 300 Grove Avenue, East Providence, Rhode Island, until 7:30 o'clock P.M. (EDST) on July 13, 1950, and will be publicly opened and read by the Chairman of the School Committee at 7:45 o'clock P.M. (EDST) in the library of the present Senior High School, Taunton Avenue, East Providence, Rhode Island.

The project consists, in general of a fireproof high school building of approximately 70,000 sq. ft. of floor area, containing 30 rooms, an auditorium, cafeteria, gymnasium, swimming pool and the development of about 20 acres for outside recreational and athletic facilities.

The contract documents, including plans and specifications, may be examined on and after June 15, 1950 at the office of the Engineers, Charles A. Maguire & Associates, 303 Fargo Head Building, Providence, Rhode Island, and copies may be obtained upon deposit of $150.00 for each set taken. The amount of the deposit will be refunded to each person who returns the plans and documents in good condition within fifteen (15) days after the opening of bids, otherwise the deposit will be retained.

Bid security in the amount of $100,000.00 shall be submitted with each bid, subject to the conditions set forth in the Instructions to Bidders.

No bid may be withdrawn for a period of thirty (30) days subsequent to the opening of bids.

The School Committee of the Town of East Providence, Rhode Island, reserves the right to waive any informalities or to reject any or all bids.

EAST PROVIDENCE SCHOOL
COMMITTEE
Francis J. Tynn
Chairman

Bids: June 20, 1950 (7925)

Erection of Guard Rail

PENNSYLVANIA TURNPIKE
COMMISSION
Harrisburg, Pennsylvania
NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission, through the Chairman, 21 North Fourth Street, Harrisburg, Pennsylvania, until 2:00 P.M., Eastern Daylight Saving Time, the 20th day of June 1950, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room No. 1, North Office Building, State Capitol, Harrisburg, Pennsylvania, and publicly opened and read aloud for the following contract:

For the erection of Guard Rail, and construction of shoulder curbing and drainage on the Pennsylvania Turnpike System. This work extends from a point near Middlesex, Cumberland County, Pennsylvania to a point near King of Prussia, Montgomery County, Pennsylvania, and from a point near the Irwin Interchange, Westmoreland County, Pennsylvania to a point near the intersection of Route 22 and the Pennsylvania Turnpike, Allegheny County, Commonwealth of Pennsylvania, a distance of approximately 137 miles.

The work consists of erecting and painting of the guard rail, and the furnishing and construction of wood shoulder curbing and drainage as indicated on the Commission Standards.

The approximate quantities of the principal items are as follows:

Guard Rail Erection and Painting, 340,000 lin. ft.; Wood Shoulder Curb, 248,500 lin. ft.; Sheet Metal Inlets, 910 each; 30" CMP Shoulder Drain, 22,800 lin. ft.

Copies of plans, specifications and contract documents will be filed and open to inspection at the office of the Pennsylvania Turnpike Commission at Harrisburg, Pennsylvania, on June 6, 1950. Plans and contract documents will not be available before this date for inspection or for issuance to prospective bidders.

Copies of contract documents, including specifications may be obtained from the Commission upon deposit of ten ($10.00) dollars for each set, such deposits to be refunded in full to any actual bidder upon return of such documents in good condition within five (5) days after the date of the opening of the bids. Refund will be made for all plans and contract documents if the project is withdrawn from letting by the Pennsylvania Turnpike Commission. Remittances are payable to the Pennsylvania Turnpike Commission and must accompany requests for drawings, specifications and contract documents.

The character and amount of bid security to be furnished by bidder is stated in the Instructions to Bidders.

The Pennsylvania Turnpike Commission reserves the right to waive any informalities in or to reject any or all bids.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

PENNSYLVANIA TURNPIKE
COMMISSION
James F. Torrance,
Secretary and Treasurer

May 25, 1950
Harrisburg, Pennsylvania

Bids: June 21, 1950 (7911)

STATE DEPARTMENT OF PUBLIC
WORKS
BUREAU OF CONTRACTS & ACCOUNTS
ALBANY, NEW YORK

Sealed proposals will be received by Henry A. Cohen, Director, Bureau of Contracts & Accounts, 14th Floor, The Governor Alfred E. Smith State office Building, Albany, N. Y. until ten thirty o'clock A.M., A.S.T. (Advanced Standard Time), on WEDNESDAY, JUNE 21, 1950, for projects in the following counties:

County	Deposit Plans	Deposit Bid	Type	Miles	Engineer's Estimate
Albany	$10	$5.000	Asp. Conc. Ty. 8	2.22	$ 96,000
Allegany	10	12.000	Asp. Conc. Ty. 1A Asp. Conc. Ty. 1A Widening, Misc. Work, R. C. Slab Br. 27'-8" Span Part 36" Welded Steel Shell Arched Inf. 135.5' Ft. Girder ER Sq. & Alpha & Beta Areas	1.83	207,000
Bronx	100	285.000	Asp. Conc. Ty. 1A Asp. Conc. Ty. 1A Widening, Misc. Work, R. C. Slab Br. 27'-8" Span Part 36" Welded Steel Shell Arched Inf. 135.5' Ft. Girder ER Sq. & Alpha & Beta Areas This project requires the use of Alpha Composite Construction which is patented and the royalty is $xx.	0.36	5,218,000
Cattaraugus	10	12.000	Asp. Conc. Ty. 1A Asp. Conc. Ty. 1A Widening, Misc. Work, R. C. Slab Br. 27'-8" Span	1.83	207,000
Chenango	10	2.000	Bit. Type Grade Ratio	1.04	55,000
Clinton	10	6.000	Asp. Conc. Ty. 1A Asp. Conc. Ty. 1A Widening, Misc. Work, R. C. Slab Br. 27'-8" Span	3.07	161,000
Erie	15	24.000	Asp. Conc. Ty. 1A Asp. Conc. Ty. 1A Widening, Misc. Work, R. C. Slab Br. 27'-8" Span This project requires the use of Alpha Composite Construction which is patented and the royalty is $xx.	0.74	410,000
Herkimer	10	7.000	Asp. Conc. Ty. 1A Asp. Conc. Ty. 1A Widening, Misc. Work, R. C. Slab Br. 27'-8" Span	4.22	121,000
Lewis	10	8.000	Asp. Conc. Ty. 1A Asp. Conc. Ty. 1A Widening, Misc. Work, R. C. Slab Br. 27'-8" Span	5.00	132,000
Montgomery	15	36.000	Asp. Conc. Ty. 1A Asp. Conc. Ty. 1A Widening, Misc. Work, R. C. Slab Br. 27'-8" Span	4.89	603,000
New York	100	180.000	Asp. Conc. Ty. 1A Asp. Conc. Ty. 1A Widening, Misc. Work, R. C. Slab Br. 27'-8" Span Part 36" Welded Steel Shell Arched Inf. 135.5' Ft. Girder ER Sq. & Alpha & Beta Areas	0.28	3,294,000
Niagara	15	24.000	Asp. Conc. Ty. 1A Asp. Conc. Ty. 1A Widening, Misc. Work, R. C. Slab Br. 27'-8" Span This project requires the use of Alpha Composite Construction which is patented and the royalty is $xx.	0.74	440,000
Onondaga	10	14.000	Asp. Conc. Ty. 1A Asp. Conc. Ty. 1A	0.65	282,000
Queens	15	17.000	Asp. Conc. Ty. 1A Asp. Conc. Ty. 1A Widening, Misc. Work, R. C. Slab Br. 27'-8" Span	0.55	308,000
Suffolk	100	95.000	Asp. Conc. Ty. 1A Asp. Conc. Ty. 1A Widening, Misc. Work, R. C. Slab Br. 27'-8" Span Part 36" Welded Steel Shell Arched Inf. 135.5' Ft. Girder ER Sq. & Alpha & Beta Areas	4.15	1,729,000

OFFICIAL PROPOSALS

Sullivan	15	15.000	Bit. Mac. Pen. 0.51 Mets. Ty. 1 Conc. Sub Br. 25' Span I-Beam Br. 60' Span Alpha I-Beam Br. 84' Span (This project requires the use of Alpha Composite Construction which is patented and the royalty is $xx.		268,000
Sullivan	10	28.000	Asp. Conc. Ty. 1A Asp. Conc. Ty. 1A Opt. Misc. Work	18.00	440,000
Tioga	10	3.500	Asp. Conc. Ty. 1A Asp. Conc. Ty. 1A Opt. Misc. Work	1.38	60,000
Wayne	10	3.000	Landscaping	18.00	57,000
Wayne	10	10.000	Asp. Conc. Ty. 1A Asp. Conc. Ty. 1A Opt.	5.08	173,000

Maps, plans, specifications, and estimates may be obtained at the office of the Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers in whose district the roads are located. The name and address of the District Engineers will be furnished on request, and may be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract indicated. A refund will be made in full to bidders for return of one set in good condition within 20 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by cash, draft or certified check payable to the order of State of New York, Commissioner of Taxation & Finance, for the sum as specified in the advertisement and the proposal. The penalties and disposition of the bidding deposits, the execution of the contract and bonds shall conform to the provisions of the Highway Law as set forth in "Instructions to Bidders".

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

H. D. TALLAMY
Supt. of Public Works

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation, Sealed Bids (Specifications No. 7-1-60) will be received by Bureau of Reclamation, Trenton, Nebraska, June 22, 1950, and then publicly opened for furnishing labor and materials and performing all work for the completion of Trenton Dam, Frenchman-Cambridge Division, Nebraska, Missouri River Basin Project, consisting of an earth dam on the Republican River about 2 miles west of Trenton, Nebraska, on U. S. Highway No. 34, as shown on the location map. Principal items are approximately: 60,220 cu. yds., concrete; 8,143,000 cu. yds., excavation; 60,000,000 gallons of water; 5,166,000 cu. yds., earth fill and embankment; 1,200,000 pounds, metalwork; 206,500 cu. yds., riprap; 4,666,000 pounds, reinforcement bars; 14,650 lin. ft., sewer pipe; and other work. Time allowed for completion will be 1,100 days. For particulars, address Bureau of Reclamation, Trenton, Nebraska, or Public Bldg. 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner.
(7925)

CONTRACTORS
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for New Projects

Publish your announcement thru the "Proposals Section" of Engineering News-Record and get their bids.

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NEW ADVERTISEMENTS received by June 12th at the New York Office 330 W. 42 St., N. Y. 18, will appear in June 22nd issue subject to space available

ESTIMATOR—Wanted

Growing concern, doing building, sewer, road and general construction in Ohio. Experienced man preferred, permanent position. State qualifications, exp., age, former employer, references, salary expected, first letter.

P-6222, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

CONTRACTING ENGINEER
STRUCTURAL STEEL

Long established steel fabricating plant in New England has an opening, due to promotions, for a man with experience in estimating and selling structural steel and miscellaneous iron work.

He must have personal qualifications and sufficient experience to enable him to take charge of these departments.

Submit complete resume in strict confidence.

SW-6288, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ESTIMATOR

Wanted by established Pittsburgh firm of commercial and industrial contractors. Must have had experience with contractors engaged in similar work. State salary experience and when available. Splendid opportunity for advancement.

P-6199, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ENGINEER, LICENSED
in New York State
Also Sales Engineer

Experienced in bridge construction and alterations. Permanent position for right man. Reply stating experience to

P-6196, Engineering News-Record, 330 W. 42nd Street, New York 18, N. Y.

GRAVEL PLANT SUPERINTENDENT

Wanted for operating and managing portable and permanent plants in Indiana and Michigan. State experience, references and salary.

P-6206, Engineering News-Record, 520 N. Michigan Ave., Chicago 11, Ill.

BOLT and NUT SALESMAN

Heavy Hardware Manufacturing Company offers position to salesman experienced in contacting general contractors.

SW-6249, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

FENCE AGENCY
AVAILABLE

National Chain Link Fence Manufacturer has agency opening. Experienced fence man preferred.

RW-6095, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

REPLIES (Box Nos.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

CONSTRUCTION COMPANY, operating nationwide, specializing in structural concrete such as bridge piers and their foundations and mass concrete such as dams, requires A No. 1 construction engineer and estimator capable of planning and layout, including forms, and economical handling of materials. To be considered, complete information must be furnished. Our organization has been advised of this advertisement. P-6264, Engineering News-Record.

SURVEY MAP Draftsmen and Computers. Metropolitan New York. P-6254 Engineering News-Record.

CONTRACTORS ENGINEER—Technical graduate between 25 and 35, with experience as estimator and job manager on building construction. Knowledge of brick masonry desirable. Excellent opportunity with nationally operating masonry contractor. State age, education, experience, salary desired, references and furnish recent photograph; the first letter. P-6278 Engineering News-Record.

STRUCTURAL STEEL and Ornamental Iron Shop of medium size located in New Jersey needs experienced estimator who can also layout. Also one first class outside layout man to give full details. P-6256, Engineering News-Record.

INSTRUCTOR IN Civil Engineering. Good opportunity for ambitious teaching. Well equipped department. New England College. P-6267 Engineering News-Record.

ENGINEERING COMPUTER and Draftsman-Designer. Experience needed. Thorough knowledge of mathematics, computing machine and use of staff, system of operations. Work involved is subdivision of large tracts of land into small lots. Familiarity with curvilinear and irregular subdivisions required. Work is located at Manhasset, N. Y. Preferred man located near by to work at that location as he is the problem. Phone Manhasset 7-6747 or A. Munene, 3500 Northern Boulevard, Manhasset, N. Y.

SELLING OPPORTUNITY OFFERED

SALES REPRESENTATIVES—gain security, independence, big profits. Experience unnecessary. Write Eastern Laboratories, Dept. 3, Bilings at asset. Excellent territory. Write RW-6302, Engineering News-Record, stating complete detailed background. Application is confidential.

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SALARIED PERSONNEL $4,000 to $25,000. This confidential service established 1920 is employed by hundreds of firms who seek it to find the right man to fill their positions. Send your qualifications stating if you are employed only for details. Personal interviews invited. Jere Thayer Jennings, 234 Orange St., New Haven, Conn.

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Executive, project superintendents, engineers, instrumentmen, mechanics and all qualified personnel linked with construction. Heavy industrial, earth moving, handling, petroleum, building, etc. Responsible firms can fill their job desperation in the U. S. and Foreign Construction Competitions, without service or contract or approval.

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BETTER JOBS—Business Travel, Engineers, Construction Workers. We can help you connect. $1.00 brings advice where how apply. Write Personnel Service, Box 756, Sacramento, Calif.

POSITIONS WANTED

CIVIL ENGINEER, Age 35, with sixteen years of varied experience. Major portion as field engineer, in resident on airports, harbor construction and installations and multiple purpose dams, wants position in the tropics or South America. Speaks and writes Spanish. Prefer South American or Pacific Islands. Available after June 15, 1950. If you want the job done, I'll get it done for you right and on schedule. Address: Civil Engineer, P.O. Box 1951, Little Rock, Arkansas.

CIVIL, CONSTRUCTION, Engineer, Age 47, married, Reg. P.E., 2 Southern States, 20 years experience heavy construction, utilities, railroads and highways. Desires sales or engineering work. PW-6275, Engineering News-Record.

ELECTRICAL ENGINEERING graduate and ex-Naval officer, Civil Engineer Corps, 2½ married. Experience 20 years electrical power distribution, system design, field supervision and construction, consulting engineering, preparation of reports, cost data, etc. Available 1 July for well paying permanent position in or outside United States. PW-6269, Engineering News-Record.

STRUCTURAL DESIGNER desires position, at present employed. Graduate engineer, Rensselaer Poly. Inst. U.S.N.A., U.S.A.C.E.M.S. Degree in architecture. Age 29. PW-6282, Engineering News-Record.

(Continued on the opposite page)

POSITIONS WANTED

(Continued from the opposite page)

CONSTRUCTION MGR.-Asst. Supt. Exp. includes all details of entire heavy and light bldg. and allied constr. 20 yrs. exp. Salary $175.00 week. PW-6380, Engineering News-Record.

PROJECT MANAGER or Construction Supt. available immediately. 46 years old, 24 years experience supervising construction of industrial, institutional and commercial work; heavy, water and sewerage work; estimating and supervising field and office personnel to finish. Education: Civil Engineering. PW-6381, Engineering News-Record.

ESTIMATOR-ENGR. extensive heavy, rail, highway & marine construction with architectural & industrial experience wants to locate in state of Ideal climate. PW-6360, Engineering News-Record.

GENERAL SUPERINTENDENT, 20 twenty-five years experience. Thoroughly experienced in all phases of heavy, highway and engineering construction. Graduate Engineer. Address PW-6299, Engineering News-Record.

PART TIME WORK WANTED

ENGINEER SKILLED steel designer. Knows steel methods, costs and estimating. Part time. Registered 4 states. Let's discuss your needs. Box 562, Philadelphia 2, Pa.

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For Sale

Profitable Ready Mixed Concrete Plant, in excellent condition. Located in South Central United States. New truck mixers mounted on late model trucks. No competition in city or county. Box 6386, Engineering News-Record.

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Patent Practice

Before U. S. Patent Office. Validity and infringement investigations and opinions. Booklet and form, "Evidence of Conception," forwarded upon request. Lancaster, Allwine & Rommel, Registered Patent Attorneys, Suite 434, 815-15th Street, N. W., Washington 5, D. C.

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Grubbing and Clearing That Can Be Done With D 8 Bulldozers.

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COMPRESSORS

1—Ingersoll-Rand Imperial Type X 10 Stationary 1500 CFM $1500.00

2—Ingersoll-Rand, Mod. K-500 W/Waukesha Hesselman Oil Engine Portable Mounted Pneumatics—Late models. Excellent Cond. . . . . $5500 ea.

STIERS BROS. CONSTRUCTION CO.

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Lorain 75 A Shovel

with 7/8 digging end and 1½ yd. Amsco bucket. Reasonable.

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Have approximately 4000 sq. ft. of Atlas Metal Forms, used only once. Will consider reasonable offer.

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NEW
SACRIFICE PRICE $1,850.00

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Truck Cranes—7 to choose from
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All in good working condition

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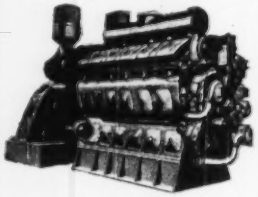

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937.5	General Motors	12-567	1080	720	312	Clark	VH1-4	375	327
625	Alco	6-12 9x33T	750	600	125	General Motors	3-268A	150	1200
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400	Buckeye	80	480	600	62.5	Int'l Harvester	U24-1S	76	1200

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TRUCKS: Euclid model T, end dump, rock bodies, 22 ton cap., 275 H.P. Cummins motors.

BELT CONVEYOR: 2800 ft., all steel, 36", with roller bearing troughing and return idlers, 5 ply cord belt, 42 oz. duck, 1/8" top, 1/16" bottom. NEW 1947, slightly used.

CARS: 20—Western and Koppel 20 yd., all steel, air dump, cast steel trucks, rebuilt.

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LIMA 802 Shovel Attachments only, condition like NEW.

DERRICKS: 1—75 ton Stiff Leg, 100 ft. boom. 1—35 ton Guy, 88 ft. boom, 98 ft. mast.

DRYER or KILN: Allis Chalmers 10 ft. x 90 ft., heavy duty. Located Minnesota.

JAW CRUSHERS: Farrel 15-B, size 24 x 36", manganese fitted, with or without motor and drive. Pioneer 24 x 36" portable, with or without diesel power. Also, all sizes 4 x 6 to 48 x 60.

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Several others, single and double drum, 150 H.P. to 1050 H.P.

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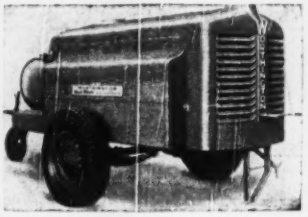

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1—G.E.—70 ton Diesel-Elec. 4-Motor—35000 T.E. 13199 New Nov. 1941.

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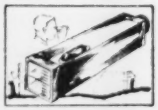

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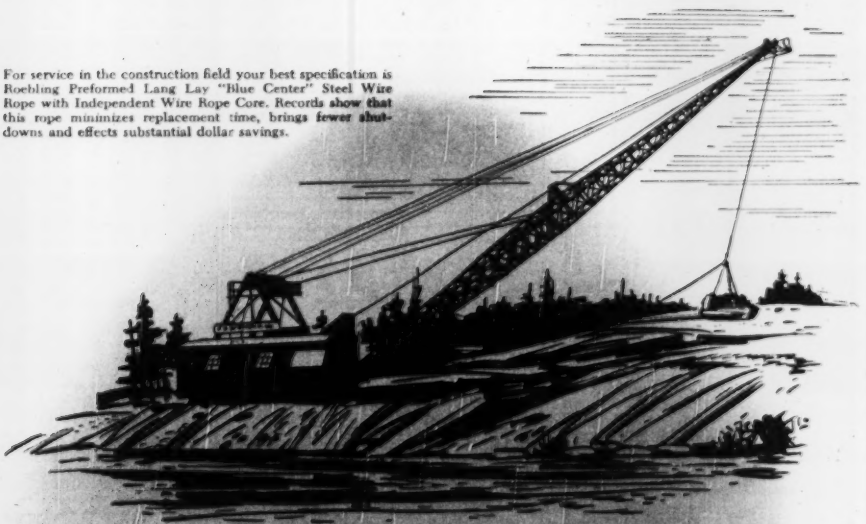

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There's a Roebling wire rope of the right construction, grade and size for every type and make of rope-rigged equipment. Have your Roebling Field Man tell you which rope will give the best and the lowest-cost performance for every installation. John A. Roebling's Sons Company, Trenton 2, New Jersey.

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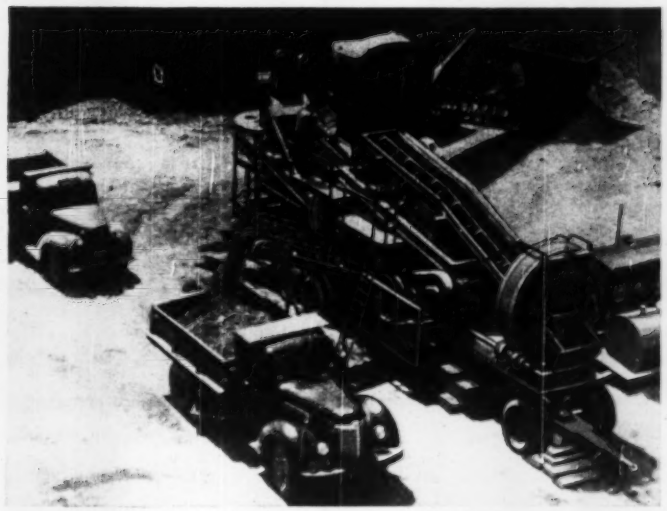
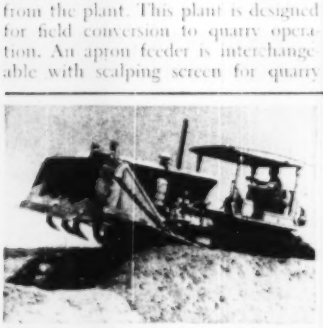
NEW PRODUCTS



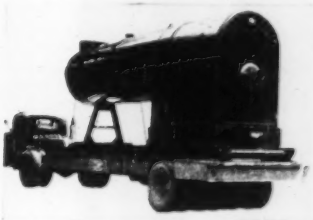
Portable Gravel Plant Features Three Crushing Stages

PRE-SCREENING operation on the TwinDual Gravel-King sizes and removes natural sand and gravel. Large boulders are scalped to the large opening primary. Material requiring secondary reduction is bypassed to the TwinDual roll crusher for second and third stages of crushing. One hundred percent chips can be produced, or finished material from the scalping screen blended with crushed material from the plant. This plant is designed for field conversion to quarry operation. An apron feeder is interchangeable with scalping screen for quarry rock. The Gravel-King is made in two sizes—the Junior has an 1824 roller bearing jaw crusher, 24-in. TwinDual roll secondary, 5x8 ft 2-deck gyrating screen, 3x6-ft 2-deck gyrating scalping screen, and swivel-feed conveyor; the Senior has 2036 roller-bearing jaw crusher, 30-in. TwinDual roll secondary, 4x10 ft 2-deck gyrating screen, 4x10-ft 2-deck gyrating scalping screen, and swivel-feed conveyor. Complete plant operates from one power unit.—UNIVERSAL ENGINEERING CORP., DIV. PETTIBONE MULLIKEN CORP., CEDAR RAPIDS, IOWA.



Back-Rip Scarifiers

Teeth mounted on back side of bulldozer moldboard rip ground when tractor backs up. The Back Rip scarifiers float on top of ground as tractor moves forward. Uses for the teeth include: Rip and loosen packed soil, black top, and hard ground; rake out rocks and roots, making forward blading easier and faster; and eliminate deadhead time. Set consists of four curved-shank, capped, locked-on replaceable teeth mounted in housing welded to back of moldboard. Teeth can be raised and pinned out of way when not in use.—PRECO, INC., 6300 E. SLAUSON AVE., LOS ANGELES 22, CALIF.



Boiler for Asphalt Plants

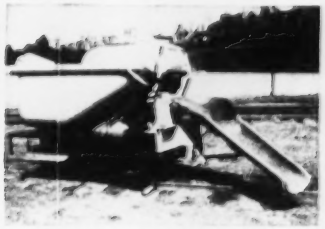
Portable 104-hp boiler, designed for working pressures up to 150 psi, is especially recommended for use in conjunction with asphalt plants. The Lucey 104 features a 1,040-sq ft heating surface, a 160-ft furnace volume, steam volume of 54 ft, and an oversized seamless firebox. The boiler is adaptable for oil, gas, or stoker firing, and may be skid-mounted for portability. The 30-in.-dia stack is 28 ft long. Additional sections are optional. The unit measures 22 ft 6 in. x 6 2 in. x 7 ft 6 in., and weighs 15,000 lb.—Lucey Boiler & Mfg. Corp., 1516 Chestnut St., Chattanooga, Tenn.

Jeep-Mounted Drill

Lightweight drill (Model B35) augers holes with 3 to 12 in. dia. It is supplied complete with all equipment for adaptation to a Jeep, truck, or tractor power take-off. Among recommended uses are: Soil testing, augering post holes, locating bridge foundations, drilling shallow wells, drilling borrow pits, and locating mineral beds. In vertical position, with 4½-in. tool, it will auger to depths of 100 ft without the use of water. A mobile turntable converts the B35 to a horizontal drill. Feed is hydraulic.—MOBILE DRILLING, INC., 960 N. PENNSYLVANIA ST., INDIANAPOLIS 4, IND.

Saw Pump Operates Dry

Factory-sealed water pump on Model HD wet-or-dry masonry saw eliminates the necessity for disconnecting pump when cutting dry. To switch from wet to dry cutting, the operator turns a pet cock on the outlet of the pump. Company reports the pump can not be damaged by dry cutting. No maintenance is necessary as a factory exchange plan is set up to handle any difficulty. The Clipper saw handles all masonry materials from 12-in. concrete block to 1-in. quarry tile.—CLIPPER MFG. CO., DEPT. *ENR*, 2800 WARWICK TRAFFICWAY, KANSAS CITY 8, MO.



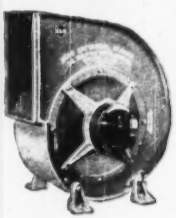
Improved Dumpcrete

Job-tested Dumpcrete improvements include: Swinging baffle inside body has been increased in overall height and relocated to improve dis-

(Continued on next page)

ILG VENTILATION

Over ten years ago, Mr. Gutridge recommended an ILG Centrifugal Fan to the W. P. Fuller Paint Company of Los Angeles for removal of fumes from paint mixers (above). The exhaust system engineered by Mr. Gutridge is still on the job today, providing Fuller employees with a clear, cool, fresh atmosphere. That's proof that ILG *pays-off in performance!* And that's why Mr. Gutridge has always "strongly recommended ILG equipment wherever possible." Whatever *your* ventilation problem, there is ILG equipment "custom-built" to your specifications . . . capacity-wise, price-wise. Call nearby ILG branch office (consult classified directory) or send coupon today for FREE BOOKLET.



ILG Direct-Connected Centrifugal Fan . . . saves one-third on space, 25% on installation and maintenance, 10 to 15% on power costs.

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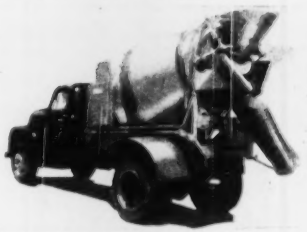
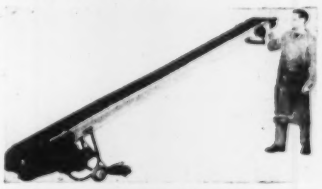
charge action; gate wings are built higher with longer slope to permit faster, easier unloading; and sides of hopper section chute have been increased to eliminate concrete overflow. Swingaway-type chute has been added to the 4-yd body. For driver convenience, strap steps are provided on front and rear running boards, and gate discharge handles are more easily accessible.—MAXON CONSTRUCTION CO., DUMPCRETE DIV., 131 N. LUDLOW ST., DAYTON 2, OHIO.



Reduced-Weight Truck Mixers

Loadlimit Smith-Mobiles haul full-rated truck-mixer payloads while meeting highway load limitations imposed by most states. Reduced weight is accomplished through elimination of parts and assemblies which are not basic or necessary to mixer operation. Loadlimit model can be quickly changed to a standard truck mixer or agitator; or, a standard model can easily be converted to a Loadlimit model. The new machines are available in 2, 3, 4½, and 5½-yd sizes.—The T. L. Smith Co., 2851a N. 32nd St., Milwaukee 10, Wis.



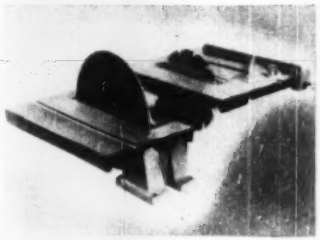
Lightweight Belt Conveyor

Aluminum power belt conveyor is available in five standard lengths from 11 to 21 ft with 10 or 16-in. belt widths. The Stevedore, Jr., operates horizontally or at any angle up to 40 deg. Two-way belt travel permits use in loading and unloading operations. Unit is available with cushion-rubber or pneumatic-tired wheels.—THE RAPIDS STANDARD CO., INC., DEPT. ASJ, 342 RAPIDSTAN BLDG., GRAND RAPIDS 2, MICH.

Carbon-Dioxide Producer

Carbonization of lime-softened drinking water is simplified by modern unit for producing and diffusing carbon dioxide into water. Gas formed by Carbalt unit is diffused by a Diffusair unit, said to insure 95% absorption and to eliminate clogging and

corrosion troubles. Burner receives fuel and air under pressure so that gases leaving the producer are under sufficient pressure for self injection. Complete safety devices are provided to shut unit down and sound alarm in case of flame failure, excess water temperature, or other unsafe condition. Units are available with capacities ranging from 20 to 576 lb of carbon dioxide per hour.—WALKER PROCESS EQUIPMENT, INC., 518 HANKES AVE., AURORA, ILL.



Bench Saw; Disk Sander

Combination 8-in. bench saw and 9-in. disk sander has a ripping fence, miter slide, and both tables tiltable from 0 to 45 deg. Saw table is adjustable in height for dado work and either table can be removed entirely for mounting accessories. Over-all dimensions are 21x13¾x12 in.; weight is 16 lb.—DUO-MASTER INDUSTRIES, 242 ROWE BLDG., SPARTA, MICH.

New Product Briefs

Expanded diesel-engine line now includes five 4-cyl models and six 6-cyl models ranging in output from 90 to 200 hp. Refinements in design of these engines are said to provide more power, greater economy and dependability, and longer life. Maker: Murphy Diesel Co., Milwaukee 14, Wis.

Damp-resistant product for coating interior of exterior masonry walls is a non-fibrated liquid asphalt compound, free of coal tar. Plasterbond dries with a tacky, elastic film that permits plastering after 24 hr. Foundation Coating resists seepage of underground moisture through exterior masonry or concrete walls below grade. Both products can be applied by brush or spraying. Maker: The Philip Carey Mfg. Co., Cincinnati 15, Ohio.

Mobile transmitter-receiver is designed for adjacent channel operation in urban and metropolitan areas. Said to improve performance in the crowded radio-frequency spectrum, it consists of a 10-w transmitter, receiver, and power supply in one cabinet. Maker: General Electric Co., Syracuse, N. Y.

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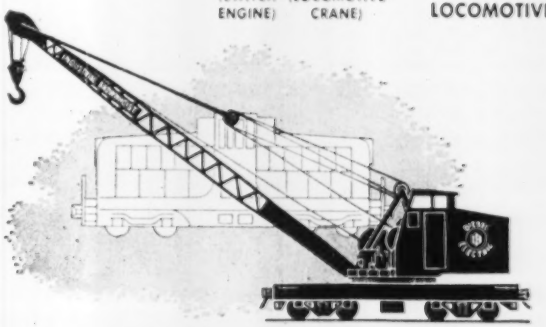
(SWITCH ENGINE) (LOCOMOTIVE CRANE) DIESEL ELECTRIC LOCOMOTIVE-CRANE



Two big pieces of material handling equipment in one — that's what you get in the Brownhoist Diesel Electric Locomotive-Crane — a heavy-duty switch engine, and a powerful locomotive crane of 30 tons capacity, and up.

New clear-vision boom design allows operator an unobstructed view through the lower end of the boom, an area that is a blind spot on many cranes.

And the Monitor-type cab assures 360° visibility from the operator's position. Safety engineered design gives 14" clearance between revolving upper work and car body.

Write today for more complete information.

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MANUFACTURERS' PUBLICATIONS

Electric Sump Pumps—All-bronze electric sump pumps for pit depths to 3 ft are described in Leaflet 3250. This bulletin covers hourly drainage capacities, construction, displacement-type control, power unit, and dimensions of the Drain-Dri line.—YEOMANS BROS. CO., 1445 N. DAYTON ST., CHICAGO 22, ILL.

Baseboard Heating—Theory of operation, design, and installation of radiant baseboard heating is explained in this 34-p catalog. Feature of the catalog is the use of large photographs showing typical installations, and schematic drawings indicating the how and why of radiant heating.—UNITED STATES RADIATOR CORP., 300 BOOK BLDG., DETROIT, MICH.

Duraplastic Concrete—Origin, development, and applications of Duraplastic air-entraining cement is traced in a 20-p catalog. This catalog plays down technical details and accentuates pictorial presentation. More than fifty typical installations made during the past decade are illustrated and captioned to emphasize the advantages and results claimed for this cement in making durable concrete.—UNIVERSAL ATLAS CEMENT CO., 723 CHRYSLER BLDG., NEW YORK 17, N. Y.

Electric-Generator Sets—Pamphlet describes different uses for independent electric generating sets. The various types and sizes available, and the purposes for which they are best suited, are listed.—UNIVERSAL MOTOR CO., 413 UNIVERSAL DRIVE, OSHKOSH, WIS.

Concrete Inserts—Bulletin (4 pp) describes advantages of Unistrut concrete inserts. Bulletin CI 2 emphasizes the fact that these inserts permit attachment of fittings at any point along the insert face without disturbing attachments previously made. Complete specifications and ordering information are included.—UNISTRUT PRODUCTS CO., 1013 W. WASHINGTON ST., CHICAGO 7, ILL.

Form Clamps and Ties—Revised specifications for form clamps and ties for architectural concrete are available in printed form. These set forth amount of disconnection recommended for exposed or non-exposed surfaces, types of spacers, new type of aligners and anchors, and waler supports and their value in holding forms to alignment. The specifications list recommended factor of safety for ties over actual estimated pressure because of severe and unexpected conditions of impact and vibration, as well as unusual head of concrete over average rate of fill.—WILLIAMS FORM ENGINEERING CORP., 1501 MADISON AVE., S. E., GRAND RAPIDS 7, MICH.

Cast-Iron Pulleys—Complete line of Blue-Face cast-iron pulleys is listed and described in 16-p Bulletin 33. Table of contents on front cover facilitates quick reference. Supplementary Bulletin 35 carries case histories of installations of the Belt-Saver tail pulley for bucket elevators and belt conveyors. Pulley is furnished in diameter sizes from 6 to 40 in.—SPROUT-WALDRON & CO., INC., MUNCY, PA.

Drafting-Room Equipment—Data sheet lists a steel 4-post drafting table and an all-steel portable tracing board. The table is available with shallow and tool drawer, without drawers, with tool drawer only, and with shallow drawer, tool drawer, and auxiliary 2-drawer unit. Each style is illustrated on the data sheet. Prices are listed for each style in the various sizes in which they are available.—STACOR EQUIPMENT CORP., 1887 ATLANTIC AVE., BROOKLYN 33, N. Y.

Surveying Equipment—Pocket-size folder describes a complete line of surveying instruments. Items listed include precision steel tapes, pocket tapes, frame tapes, oil-gaging tapes, plumb bobs, tape hooks, tape wipers, special tapes, transits and leveling instruments, targets and plumb bobs, and draftsmen's tools.—THE L. S. STARRETT CO., ATHOL, MASS.

Conveyor Magazine—Copies of The S-A Conveyor are available free to those interested in conveyor operation. Published quarterly, this magazine contains interesting articles dealing with job applications of various types of conveyors. The magazine also contains information on proper handling and maintenance of these units.—STEPHENS-ADAMSON MFG. CO., AURORA, ILL.

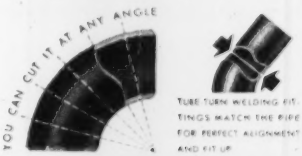
IH Catalogs—Three new catalogs are announced by the International Harvester Co. Form A-319-NN describes pipeline construction using the TD-24 and other industrial tractors of the 12 model International line. This bulletin, Form A-420-MM, entitled, "Is Your Horsepower Going to the Track?", lists performance-boosting and cost-cutting features of International crawler tractors. Form A-419-

(Continued on page 127)

HOW TO SIMPLIFY ODD-ANGLE PIPING

The ease with which pipe can be installed at odd angles for compactness is an important reason for the widespread preference for Tube-Turn Welding Fittings.

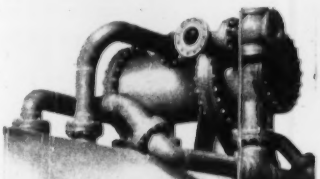
For example, one of the country's leading consulting engineers (name upon request) states: "We employ a great number of experienced welders in all parts of the country. They all prefer Tube-Turn Welding Fittings because many of the fittings we use must be cut to odd angles. When lining up the fittings, cutting them and placing them into the line, our welders say they are more



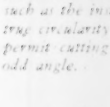
sure of accurate alignment and fit-up with Tube-Turn Welding Fittings than with any other make."

There's good sound reason behind this preference. Tube-Turn Welding Elbows and Returns are formed to give you *true circularity . . . accurate curvatures and center-to-face dimensions . . .* and *absolute uniformity of wall thickness. Hence, you can cut a Tube-Turn Welding Elbow or Return to any odd angle required and it will line up perfectly with the pipe.*

Tube-Turn Welding Fittings are available in a *complete range of sizes, shapes and materials.* For speed, simplicity and versatility in piping installations, be sure you get *genuine* Tube-Turn Welding Fittings.



Tube-Turn Welding Fittings simplify the fabrication of intricate piping system designs such as the installation shown above. Their true circularity and uniform wall thickness permit cutting and welding them at any odd angle.



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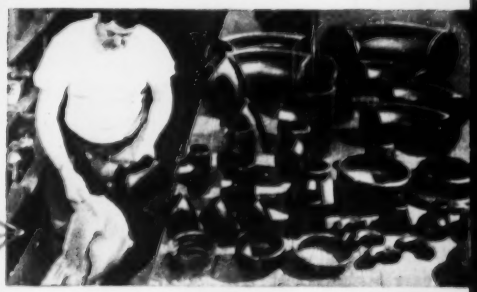

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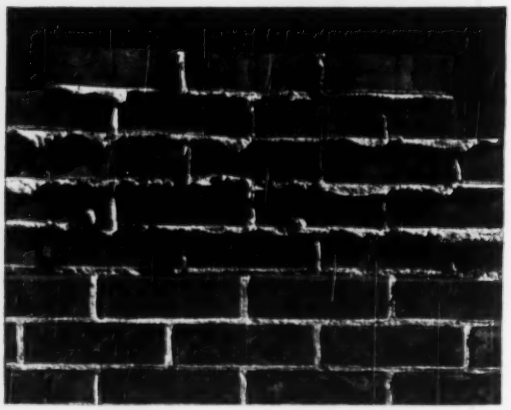
GOOD BRICKWORK = GOOD DESIGN + GOOD WORKMANSHIP + GOOD MATERIALS

The face brick should be backplastered.

If the back-up units are laid first, the front of the back-up units should be plastered.



Backplastering should not be attempted over protruding mortar joints.

PARGING

WITH

BRIXMENT

HELPS ASSURE

DRY WALLS

WE SUGGEST THAT—

The face brick should be backplastered with not less than ⅛ of an inch of mortar before the back-up units are laid.

Or, if the back-up units are laid first, the front of the back-up units should be plastered with not less than ⅛ of an inch of mortar before the face brick are laid.

Heavy rains don't make brick walls leak — they merely reveal the fact that the walls contain voids or passages through which the water may penetrate.

Dry brick walls are primarily the result of good design and good workmanship. Good materials are important, but still secondary. The more *plastic* the mortar used, the easier it is for the bricklayer to deliver good workmanship.

The photos at the left show some points of *good workmanship.*

Brixment mortar has greater plasticity, higher water-retaining capacity and better bonding quality. Because of this *combination* of advantages, architects, contractors and dealers all over America have for thirty years made Brixment the largest-selling mortar material on the market. Why not try it yourself?

LOUISVILLE CEMENT COMPANY, Incorporated, LOUISVILLE, KENTUCKY

(Continued from page 124)

MM describes 3-point track suspension, and function of the front stabilizer. It is entitled, "How Long Is Your Tractor's Life Line?".—International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

Testing Machines—Catalog RC-2-50 covers hydraulic compression-testing machines and other equipment for testing concrete, brick, tile, and other construction materials. Catalog RU-3-50 describes the Model MA universal hydraulic-testing machines. Both are profusely illustrated and include details of construction, specifications, and dimensions.—Riehle Testing Machines Div., American Machine & Metals, Inc., East Moline, Ill.

Lighting Fixtures—Sectionalized catalog lists complete line of slimline and fluorescent fixtures. Fluorescent spiates and incandescent Display O-Lites are also featured. The catalog contains pictures, descriptive material, engineering data, photometric data, and recommended uses of all Philite products listed.—Ruby Philite Corp., 32-02 Queens Blvd., Long Island City 1, N. Y.

Sewage-Sludge Dewaterer—Outstanding advantages claimed for the Oliver sewage-sludge dewaterer are listed in Bulletin 219. Features of construction and operation of this unit are described. General data listed on the final page cover standard sizes.—Oliver United Filters, Inc., 33 W. 42nd St., New York, N. Y.

Residential Panel Construction—Simplified method of erecting small residential panels of glass blocks is described in new booklet, "Beauty Spots for Your Home". Method described eliminates structural accessories such as wall ties, expansion joints, and wall anchors. Panels covered must be 25 sq ft, or less, in area, and have a height of no more than 7 ft, or a width of no more than 5 ft.—Pittsburgh Corning Corp., 307 Fourth Ave., Pittsburgh 22, Pa.

Asphalt Plants—Complete line of White asphalt plants is described in Circular 39. This circular describes portable pavement repair trucks with capacities to 10 tons per hr; moderate-size asphalt paving plants with capacities to 30 tons per hr; large models equipped with vibrating separation screens, multi-compartment hot-storage bins, dust collectors, and either volumetric control or weigh scales. Also described are separate units of aggregate driers and pug-mill mixers.—White Mfg. Co., Elkhart, Ind.

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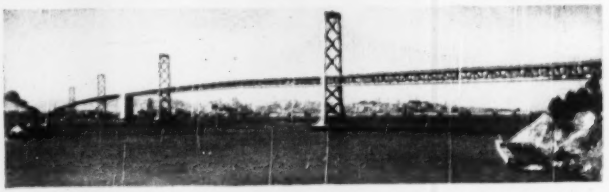


Confusion in San Francisco

The sign on the door on the second floor of 74 New Montgomery St., read "Division of San Francisco Bay Toll Crossings, California Department of Public Works," but quite obviously, no toll crossing business was being done.

"Come in," said the man with his coat off. He sat on an odd-shaped crate, nailing it shut with quick, savage blows of the hammer. "Come in and watch the burial of San Francisco's hopes for a new Bay crossing. The sad part is, they're dead and San Franciscans—the people most concerned—don't suspect it."

"You want to see Ralph Tudor, our chief engineer, I suppose. As usual, he's at a hearing, explaining the plan for a second Bay Bridge before some local politico more interested in headlines than in information. Mr. Tudor spends most of his time that way these days. He's very philosophical about it—says it's a politician's duty to find out if engineers know what they're talking about. Frankly, I don't think they care.

"You want to know why? Take this box I'm sitting on. It contains one of the elaborate set of models that we made, showing just how the approaches to a new Bay Bridge parallel to the existing one would collect and distribute the traffic in downtown San Francisco. Such approaches would also have given the city a group of elevated highways that would have taken a lot of traffic off the streets, traffic that merely wanted to move more freely from one part of the business district to another.

"Do the politicians want to understand this? They do not. They tell the people that a parallel bridge will disgorge new streams of vehicles into an area already jammed with traffic. They claim they want a crossing farther south. The fact that the motorists now crowding the present Bay Bridge to the danger point won't travel 5 miles out of their way to use a bridge farther south is disregarded. The important point is that the solution to the traffic jams in the downtown area is now being crated away in these boxes, as is the key to successful relief of the congested Bay Bridge.

"Even our Congressmen in Washington are parties to this confusion. The federal government is involved because it helped finance the existing bridge and owns some of the needed new right-of-way. Senator Knowland introduced bills to get necessary federal right-of-way across Yerba Buena Island and to permit continued collection of tolls on the existing bridge to help pay for the new one. And then Senator Downey opposed the bills, as did several California Congressmen. Add an expressed preference for a southern crossing by the Department of Defense, and San Francisco's chances for a new Bay crossing are completely and thoroughly fouled up.

"You think this is just sour grapes, that I and all the rest of these guys around here are sore because we're out of a job? You're wrong. We've already got other jobs—go to work just as soon as we clean up this mess around here. Sure, we're sorry to break camp, to see a fine engineering organization disbanded, but we're more sorry to see the people of San Francisco getting a raw deal.

"Here's how raw it is:

"A southern crossing can't be financed until sometime in the future, and then only with higher tolls, but the citizens are led to believe otherwise.

"A parallel bridge will readily pay for itself, but the citizens are told that it will make traffic congestion worse in the downtown section of San Francisco.

"Actually the approaches designed to handle the traffic from the old and a new bridge would distribute this traffic widely, and in addition would furnish an elevated express system for strictly intra-city traffic, but the citizens are told that it would be prohibitive in cost and too complicated to be efficient.

"Postponing the building of a second Bay Bridge is held up as a great victory, but the citizens are not told that the prospects for financing any type of new crossing will be pretty thin if the present bridge should become toll free in the meantime. At the present rate of amortization, that could happen within three years.

"And the mirage of great fills across the Bay, called the Reber Plan, is being allowed to cloud the issue, when numerous engineering studies have pointed to its impracticability as well as to its exorbitant cost.

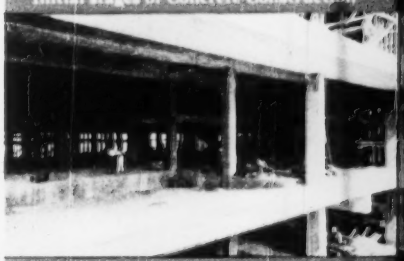
"Pretty discouraging, isn't it? Maybe a group of public-spirited citizens, who know what's what, could revive the parallel bridge plan by taking the leadership and permitting the local politicians to save face. They are out on a limb with their advocacy of an impracticable southern crossing, but they can't back down gracefully. You see, the parallel bridge would be a state project, and they are politically opposed to the state administration. This lacks all logic, since a southern crossing, or any other crossing of the Bay, would have to be a state project; but logic is not a characteristic of politics. A citizen's committee is about the only hope.

"The East Bay cities? Well, the principal ones are for the parallel bridge and want the approaches that have been designed to go along with it. But that isn't much help. San Francisco is usually at political loggerheads with Oakland and Alameda, and what they like over there is looked at with suspicion over here. Sort of a fear that some day San Francisco will be the suburbs, I guess. It might, too, if it doesn't solve the problem of congestion on the Bay Bridge.

"Sorry if I detained you, but you looked like you would be willing to listen. I was tired nailing these damn boxes anyway. I use a slide rule better than a hammer. Come back tomorrow, maybe Mr. Tudor will not have a hearing to go to. But don't wait too long. This office won't be here after June 30."

Radio Centro, Habana, Cuba. Architects: Junco, Gastón y Domínguez. Contractors: Purdy and Henderson. Structural Design: Ing. José A. Vila. Supt.: Ing. Bartolo Bestard. Pozzolith Concrete: Concretera Nacional, S.A.

Initial stages of Concrete Construction



Detail — Promenade and Shops

Office Bldg., foreground; Radio Studios, right background; Theater, left background.

Havana's Largest Concrete Structure built with POZZOLITH

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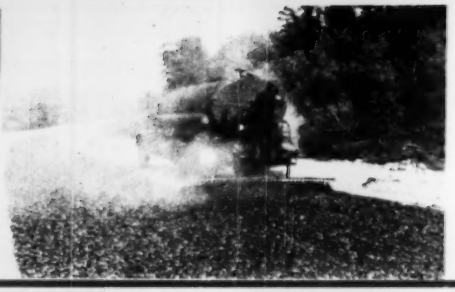

NORTH CAROLINA

(left) For this farm-to-market road, a plant-mixed Texaco Sand Asphalt wearing surface was laid over a sand-clay base.

MASSACHUSETTS

(right) A Texaco Asphalt Macadam pavement was constructed on a 12-inch gravel sub-base and 4½-inch sand-filled stone base for this superhighway near Concord.

When highway "specs" call for Asphalt - -

FLORIDA

(right) Heavy-duty Texaco Asphaltic Concrete paving was used to widen and resurface 16½ miles of U. S. Route 1 near Jacksonville.

MINNESOTA

(left) Constructing a plant-mixed Texaco Asphalt pavement on 14 miles of State Highway 15, using pit-run gravel as aggregate.

roadbuilders the country over choose Texaco

TEXAS

(left) Texaco Asphaltic Concrete paving plays important part in this State's program for by-passing traffic around the city of Austin.

SOUTH DAKOTA

(right) A 4-inch Texaco Sand Asphalt pavement is supported by a 6-inch stabilized sand-clay base on this section of U. S. Route 18.

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